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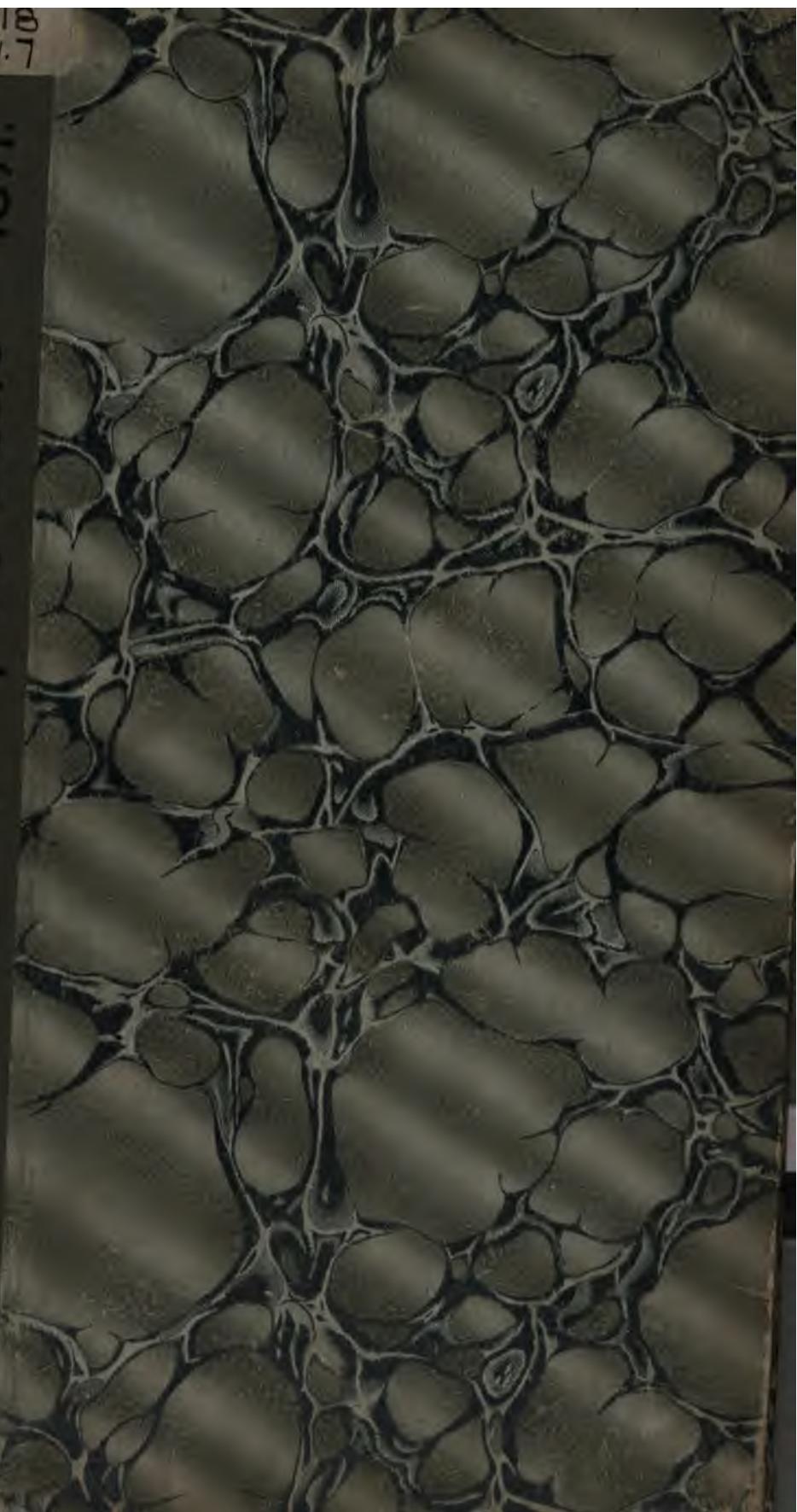
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Parker

- Navigation of the Coasts - 1871.

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REMARKS  
ON THE  
NAVIGATION OF THE COASTS  
BETWEEN  
SAN FRANCISCO AND PANAMA.

BY  
WM. H. PARKER,

*Capt. P. M. S. S. Co.*

SECOND EDITION, WITH AN APPENDIX.

SAN FRANCISCO:

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1873.



# REMARKS

ON THE

## Navigation of the Coasts

BETWEEN

### SAN FRANCISCO AND PANAMA,

BY

WM. H. PARKER,

*Commander, Pacific Mail Steam Ship Company.*

SAN FRANCISCO, JUNE 1ST, 1871.

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New York:

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## PRELIMINARY REMARKS.

---

HAVING been almost constantly running on the coasts between San Francisco and Panama, for the last four years, during which time I have made a running survey of a portion of them, I have thought that a few remarks on the subject may prove useful to the officers of the P. M. S. S. Co., employed in the same trade; and, although much of what I will say is already known to those who have been as long or longer on the coast than myself, yet, as the information has never been collected or put into print, the younger officers of the Company find it difficult to get hold of it.

These remarks are, therefore, principally intended for them, and the hints thrown out are for *their* benefit, or for the benefit of commanders running on the coast for the first time.

In a word, I desire to forestall criticism by saying, in the beginning, that these remarks are not intended for "those who know," but for those who *don't know*!

The positions assigned to the different points differ in every case from the charts and from Imray's Sailing Directions, and were determined by myself. It is probable that some are not correctly given, but I think I may say that the error will prove to be inconsiderable.

Probably the most important error of the charts is in the coast line of Guatemala and Salvador. These coasts are laid down; the Western Coasts too far to the *Eastward*, and the Southern Coasts too far to the *Northward*. Vessels approaching them are, therefore, if depending upon the charts, close in-shore before they are aware of it, and as these coasts are very low and difficult to see at night, disaster may occur.

I have made a running survey from about Tonala Bar in Mexico to Acajutla in Salvador, and I think that by drawing in the coast-line through the points, the position of which I will assign, a very fair approximation to the truth will be the result.

The *lead* is of great assistance on these coasts—in fact they differ in this respect from all others between San Francisco and Panama, being similar to the Eastern Coasts of the United States—say the coasts of New Jersey and Virginia.

The soundings are regular and give warning of a too close approach to the shore.

I propose giving—

1<sup>st</sup>. General Directions for making the voyage from San Francisco to Panama and back—giving the latitude and longitude of the salient points, shoals, &c.,—the direction of the currents and tides—description of the coasts, prevailing winds, &c., &c., &c.

2<sup>d</sup>. Sailing Directions for the Ports of Magdalena Bay, Manzanilla, Acapulco, San Jose de Guatemala, Acajutla, Libertad, Realejo, Point Arenas and Panama; with notices of the different marks for recognizing these harbors, &c., &c.

3<sup>d</sup>. General Remarks on currents and tides, the compass, the lead, winds and weather, estimating the distance from shore, fogs, &c., &c.

4<sup>th</sup>. Table of positions.

5<sup>th</sup>. Table of distances.

#### 1.—GENERAL DIRECTIONS FROM SAN FRANCISCO TO PANAMA.

[*All Bearings and Courses are Magnetic. The Distances are in nautical miles. Imray's Charts referred to.*]

After crossing the Bar at San Francisco, steer so as to pass from Point San Pedro and Pillar Point, two miles; Point Pigeon, three miles; Point Sur, two miles; Point Arguilla, five miles; Richardson's Rocks, two miles, and San Miguel Island, two miles; from which take your departure and shape a course to pass fifteen or twenty miles *outside* of Cortez Shoal. Having passed the Shoal, steer so as to pass five miles outside of the San Benitos Islands. The N. W. Benito lies in latitude 28° 18', longitude, 115° 38'.

The advantage of running for Pigeon Point, Point Sur and Richardson's Rocks is that it gives you an opportunity of *testing your compass* from the beginning. Remember that this is the most important duty you have to perform after once getting outside, and, if the weather is clear, what, with following the course I have recommended, taking the bearings of known points and observing azimuths and amplitudes, and comparing with the chart, there is no excuse if you do not ascertain the error of your compass.

You *may* make the Beniots ahead, or even on your starboard bow, and this you must look out for. There is frequently a strong Easterly set here, and you must remember in setting your course that the variation is *decreasing*.

A Reef extends about one mile N. N. W. from the N. W. Benito. If you give the Island a berth of three miles you will be on the safe side.

These Islands make in the shape of a cocked hat, and cannot possibly be mistaken.

From the Benitos steer so as to pass two miles from Cape St. Augustine, and three miles outside of Natividad Island. Natividad Island is in lat. 27° 54', long. 115° 18'. Cape Saint Augustine is in lat. 28° 3', long. 115° 23'.

These points are pretty correctly laid down on the chart. Cerros Island is hardly ever to be made out in its entire form, being enveloped in fog and mist.

Natividad is a moderately high island, three-and-a-half miles long.

There is broken water to the S. E. of this island, and I have seen it break on a rock one-and-a-half miles from the S. E. point. This, however, is not in your way unless you intend passing between Natividad Island and Point Eugenio on your way up the coast. I have never been there.

From Natividad Island steer so as to pass four miles clear of Cape San Lazaro, remembering that the variation is decreasing, and to set your course by the mean of the two magnetic compasses on the chart. Say allowing 10° easterly variation.

Port San Bartholomew is correctly laid down on the chart, but the point called Morro Hermoso is laid down about four miles too far to the westward; whereas the next prominent point (no name assigned on the chart) is put too far to the eastward. Morro Hermoso is in lat. 27° 30', long. 114° 45'.

This point which I call San Pablo, is a dark slate-colored bluff, seven miles N. W. of San Roque Island, and is in lat. 27° 14', long. 114° 25'.

About three-and-a-half miles S. E. of this is a sandy bluff, easily recognized in lat. 27° 12', long. 114° 21'.

San Roque is a small, low, rocky island in lat. 27° 09', long. 114° 19'.

About six miles E. & S. from San Roque lies Asuncion Island, in lat. 27° 07', long. 114° 13'.

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There is broken water to the S. E. of this island, and I have seen it break on a rock one-and-a-half miles from the S. E. point. This, however, is not in your way unless you intend passing between Natividad Island and Point Eugenio on your way up the coast. I have never been there.

From Natividad Island steer so as to pass four miles clear of Cape San Lazaro, remembering that the variation is decreasing, and to set your course by the mean of the two magnetic compasses on the chart. Say allowing 10° easterly variation.

Port San Bartholomew is correctly laid down on the chart, but the point called Morro Hermoso is laid down about four miles too far to the westward; whereas the next prominent point (no name assigned on the chart) is put too far to the eastward. Morro Hermoso is in lat. 27° 30', long. 114° 45'.

This point which I call San Pablo, is a dark slate-colored bluff, seven miles N. W. of San Roque Island, and is in lat. 27° 14', long. 114° 25'.

About three-and-a-half miles S. E. of this is a sandy bluff, easily recognized in lat. 27° 12', long. 114° 21'.

San Roque is a small, low, rocky island in lat. 27° 09', long. 114° 19'.

About six miles E.  $\frac{3}{4}$  S. from San Roque lies Asuncion Island, in lat. 27° 07', long. 114° 18'.

The *lead* is of great assistance on these coasts—in fact they differ in this respect from all others between San Francisco and Panama, being similar to the Eastern Coasts of the United States—say the coasts of New Jersey and Virginia.

The soundings are regular and give warning of a too close approach to the shore.

I propose giving—

1<sup>st</sup>. General Directions for making the voyage from San Francisco to Panama and back—giving the latitude and longitude of the salient points, shoals, &c.,—the direction of the currents and tides—description of the coasts, prevailing winds, &c., &c., &c.

2<sup>d</sup>. Sailing Directions for the Ports of Magdalena Bay, Manzanilla, Acapulco, San Jose de Guatemala, Acajutla, Libertad, Realejo, Point Arenas and Panama; with notices of the different marks for recognizing these harbors, &c., &c.

3<sup>d</sup>. General Remarks on currents and tides, the compass, the lead, winds and weather, estimating the distance from shore, fogs, &c., &c.

4<sup>th</sup>. Table of positions.

5<sup>th</sup>. Table of distances.

#### 1.—GENERAL DIRECTIONS FROM SAN FRANCISCO TO PANAMA.

[*All Bearings and Courses are Magnetic. The Distances are in nautical miles. Imray's Charts referred to.*]

After crossing the Bar at San Francisco, steer so as to pass from Point San Pedro and Pillar Point, two miles; Point Pigeon, three miles; Point Sur, two miles; Point Arguilla, five miles; Richardson's Rocks, two miles, and San Miguel Island, two miles; from which take your departure and shape a course to pass fifteen or twenty miles *outside* of Cortez Shoal. Having passed the Shoal, steer so as to pass five miles outside of the San Benitos Islands. The N. W. Benito lies in latitude 28° 18', longitude, 115° 38'.

The advantage of running for Pigeon Point, Point Sur and Richardson's Rocks is that it gives you an opportunity of *testing your compass* from the beginning. Remember that this is the most important duty you have to perform after once getting outside, and, if the weather is clear, what, with following the course I have recommended, taking the bearings of known points and observing azimuths and amplitudes, and comparing with the chart, there is no excuse if you do not ascertain the error of your compass.

You *may* make the Beniots ahead, or even on your starboard bow, and this you must look out for. There is frequently a strong Easterly set here, and you must remember in setting your course that the variation is *decreasing*.

A Reef extends about one mile N. N. W. from the N. W. Benito. If you give the Island a berth of three miles you will be on the safe side.

These Islands make in the shape of a cocked hat, and cannot possibly be mistaken.

From the Benitos steer so as to pass two miles from Cape St. Augustine, and three miles outside of Natividad Island. Natividad Island is in lat. 27° 54', long. 115° 18'. Cape Saint Augustine is in lat. 28° 3', long. 115° 23'.

These points are pretty correctly laid down on the chart. Cerros Island is hardly ever to be made out in its entire form, being enveloped in fog and mist.

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San Roque is a small, low, rocky island in lat. 27° 09', long. 114° 19'.

About six miles E. & S. from San Roque lies Asuncion Island, in lat. 27° 07', long. 114° 18'.

This is a larger island than San Roque, being about three-fourths of a mile long, and is sandy and sterile looking. Reefs extend a short distance to the N. W. and S. E. There is a passage between it and the main land, and I have seen whalers at anchor under its lee.

Point Abreojos is very low, and is laid down about seven miles too far to the westward. I have never been very near it, nor would I advise your approaching it, as there is a very dangerous reef off it, and (a better reason) you have no business there.

All this coast, from Point Eugenio to Asuncion Island, can be approached to within two miles or less, but on the trip down you do not want to be so close in. I shall have something to say on this point on the up-trip.

The course you have laid down to carry you four miles clear of Cape San Lazaro from Natividad Island—say S. E.  $\frac{1}{2}$  E. (but this will depend on your compass) will take you about nine miles outside of San Roque and eleven from Asuncion Island. In passing these islands you will be able to judge whether you are being set in or out, at all.

Cape San Lazaro is a bold, high bluff, and can be seen in clear weather forty miles. I have seen it thirty miles on a moonlight night. The middle of the bluff is in lat 24° 46'; long. 112° 20'.

Our vessels have frequently been set to the eastward in running from Cortez Shoal to the Benitos and again from Natividad Island to San Lazaro. I have heard captains say that they have unexpectedly made San Lazaro on the starboard bow. There are several reasons for this which I will try to explain.

In the first place the two points (San Benitos and San Lazaro) are laid down on the chart too far to the eastward.

Secondly, the compasses of most of our ships carry *in* on the down trip.

Thirdly, the variation is easterly and *decreasing*.

You will readily perceive that all these combine to carry your ship *inside* of these points, and perhaps what has been attributed to *current* is sometimes due to these reasons alone.

Still, I believe there is at times a strong easterly set, and you must be on the *qui vive*.

I don't know that I have ever heard any one complain of being *set in when bound to the N. W.* Now, why is this? Simply that the same causes which carry you *in* on the down trip, combine to carry you *off the shore* on the up trip; for a compass which

carries you S. E.  $\frac{1}{2}$  E., instead of S. E., will also carry you N. W.  $\frac{1}{2}$  W. instead of N. W.!

I have sometimes, when bound N. W., brought San Lazaro directly astern, and as long as it was in view, say three-and-a-half hours, have been unable to see that I was set in a fraction of a mile.

Upon one occasion only have I found myself *east* of my reckoning on the up trip.

Upon referring to my journal I find that I have never failed to *see* San Lazaro in passing, and have never passed it at a greater distance than five miles. Fogs must, therefore, be uncommon here.

I repeat, that I do not wish it understood that I deny the existence of an easterly current hereabout at times. I think such a current exists, and caution you against it; but I also wish to point out to you the other reasons for your being set in.

Remember, too, that the lead is of no use to you off this Cape.

From San Lazaro you will steer to pass one mile from Point Entrada, the northern point of the entrance to Magdalena Bay.

#### MAGDALENA BAY.

Should you wish to enter, Imray's Sailing Directions contains the necessary instructions, and you have Belcher's large chart of the harbor. It is all plain sailing.

I am told by Commander Russell, U. S. N., who cruised about this bay a good deal in the Ossipee, that he found the chart very correct. The American Colony is located on Almijas Bay, at the mouth of an Estero, about twenty miles from the entrance. This is called by them Lee Bay.

Off Cape Redondo there is a reef extending in a N. W. direction about one-half a mile. It is said that a rock exists in the entrance about one-third of the distance across from Cape Redondo. I have watched carefully in passing for breakers on it in heavy weather, but have never seen anything outside the reef.

At all events, the proper way in entering the Bay is to keep on the side of Point Entrada, and thus avoid all risks.

From Point Entrada you will shape a course directly for False Cape.

You can run along Margarita Island, at a distance of one mile with safety.

There is a reef extending about half a mile to the S. E. of Cape Tosco, but this is out of your way.

Should there be passengers for you at Cape St. Lucas, a fire will be lit on the conical peak near it. You can pass one-quarter mile from the "Frailes," and wait there for the boat from the shore. I think this is preferable to entering the Bay.

Should you send your boat ashore, direct the officer to pull short round the Frailes, keeping the land close aboard, and land in the bottom of the Cove to the westward of them. Do not attempt to land in front of Ritchie's house.

From Cape St. Lucas steer about S. E. by E. : E.

I have generally experienced a northerly set in crossing the Gulf of California.

If the weather is clear you may see the Tres Marias. You can also take the bearing of Cape Corrientes abeam and verify your position. *Richmond Rock does not exist.*

If you do not intend stopping at Manzanillo you will, after passing Navidad Head, shape a course for Point Tejupan; otherwise it is better to get hold of the Frailes, and pass them at a distance of one mile.

And here I must caution you against one of the most marked currents on the coast: the current running from Cape Graham, along the coast, towards Cape Corrientes, generally about *N. W.*, but sometimes setting *North*, with considerable velocity into Navidad, Tenacatita and Perula Bays. You may be *cut in a good deal*, and must be on the look out for it.

I suppose Cape Corrientes got its name from this current.

You will have the satisfaction, however, of having Captain Richards', *R. N.*, excellent chart to run by. It is very accurate, and the *views* remarkably good.

Having passed the Frailes you have only to pass one mile from Navidad, Cape Graham, and White Island, and so into Manzanilla Bay.

Point Tejupan is low, with several large rocks or islets off it. Vessels frequently anchor here in the dry season, close in shore, and inside of the islets. You can pass the Point at a distance of two miles and then shape your course for Morro Petatlan, which lies in lat. 17° 31'; long. 101° 27'.

As it is sometimes difficult to make out Point Tejupan at night, I have found it better to take a departure from White Rock Point, which lies ten miles further to the eastward, and is more readily distinguished by the rocks lying to the E. S. E. of it.

I think this point is two miles further south than marked on Richards' chart.

All this coast is bold, and can be approached to one mile, if desired.

Having passed Morro Petatlan, (and the seven remarkable white rocks lying off it,) steer to pass one mile from Point Tequepa, which lies in lat.  $17^{\circ} 17'$ ; long.  $101^{\circ} 01'$ ; thence E. by S.  $\frac{1}{4}$  S. will carry you along the beach to Griffon Island.

This beach extends without an interruption to the Heads of Acapulco.

Twenty-nine miles from the buoy in Acapulco Harbor is a low bluff (with high land back of it) coming nearly to the beach. A grove of cocoa-nut trees to the westward of it, and a few huts a mile or so to the eastward. Further on, eighteen miles from the buoy, is a ridge and conical peak, (high land back of them,) with a village to the eastward, and probably a river. If you will take an opportunity of making out these marks in the day, you will find them easily recognized afterwards at night; and of great assistance to you when running for the harbor in the rainy season.

Having passed Griffon Island, at a distance of one-quarter mile, you have only to follow round to the left into the harbor.

Leaving Acapulco, and passing one-half mile from Potrero Point, you will find the coast trending S. E. by E.  $\frac{1}{4}$  E., and *not* E.  $\frac{1}{4}$  S., *as laid down on the chart*. This it is important to recollect, especially when leaving on a dark, rainy night; or, on making the harbor from the eastward under similar circumstances.

The coast trends in this direction fifteen miles from Potrero Point to a river off which is a bar, and heavy breakers close in to its mouth. This river is twenty-one miles from the buoy, and is an excellent mark.

In the day-time you will see the river, and at night the breakers. You can run within a mile of all this coast.

In passing the river you will often find the water discolored, especially in the rainy season.

Back of it is a remarkable *corcovado* peak, in about lat.  $16^{\circ} 57'$ ; long.  $99^{\circ} 29'$ . This is a good mark for Acapulco, when you are without observations.

From the river the coast trends off to the eastward to a village forty-three miles from the buoy. You do not want to be in here, however, on the down trip, as, after passing the river, you should shape a course to pass clear of the Tartar shoal.

**TARTAR SHOAL.**—This shoal lies S. E. of the Dulce River, off a whitish-looking bluff.

The English frigate "Tartar" grounded on it in 1863. I have understood that it was surveyed by the U. S. S. "Saranac," somewhere about 1864, but in the absence of any information on this point, I have placed it on my chart, in the position assigned to it by the "Tartar"; lat. 16° 11'; long. 98° 32', and then run to clear it.

Singular to say, this shoal was discovered by the famous navigator Dampier, somewhere about the year 1680. In speaking of the Dulce River, he says: (I quote from memory,) "About six miles S. S. E. from these white cliffs lies a dangerous shoal." These are the only white cliffs on the coast, and this the only shoal.

The shoal was not put on the Spanish charts, and remained unknown until re-discovered by Captain Farnsworth.

To the N. W. of these white cliffs the land runs to a low point. When this is abeam you are seventy-six miles from the buoy.

Rounding Tartar shoal, in the position I have assigned to it, you will be nine or ten miles from the land, and perhaps will just see the breakers.

Having passed Tartar shoal you will haul up about E.  $\frac{1}{2}$  S. or E.  $\frac{3}{4}$  S., which will carry you to a large high bluff, two miles wide, called Morro Hermoso, and is in lat. 15° 58', long. 93° 32'; seven miles *west* of Morro Hermoso, in lat. 15° 59', long. 97° 40', is a smaller bluff, called by me the little Morro, a short distance to the eastward of which is a reef, and back of it a large lagoon.

Seven miles *west* of the little Morro, in lat. 15° 59', long. 97° 48', is the Rio Verde. You will often, in rainy weather, find the water discolored here.

There are a few huts midway between the little Morro and the Rio Verde.

Pass Morro Hermoso, two miles distant, and steer about E.  $\frac{3}{4}$  S. for the white rock, near Port Angeles.

About eleven miles eastward of Morro Hermoso, are the Alcatrazes, two white rocks, one hundred fifty-four miles from the buoy, in lat. 15° 55', lon. 97° 21'.

To the westward are a few huts.

In lat. 15° 50', long. 97° 03', there is a high bluff with huts among the trees; and three or four miles east of this, a river, probably the Rio Sicatela; and five miles east of this is the Rio Colotepc.

The White Rock, one and a half miles west of Port Angeles, lies in lat.  $15^{\circ} 40'$ , long.  $96^{\circ} 30'$ . It lies about a mile off the land and is an excellent mark. It is two hundred and five miles from the buoy.

Port Angeles is a small harbor for schooners, &c. It has been made a port of entry for the city of Oajaca.

About fifteen miles east of Port Angeles is Port Sacrificios, in lat.  $15^{\circ} 43'$ , long.  $96^{\circ} 12'$ , with some rocks lying half a mile off it. It is difficult to recognise, and it is always better to take your departure from White Rock.

Port Guatulco lies about twenty-six miles from White Rock, in lat.  $15^{\circ} 45'$ , long.  $96^{\circ} 04'$ , and is recognized by the *Bufadero*. All this coast, from Washington Bluff to Port Sacrificios can be approached within two miles.

The current in the dry season (winter) is generally to the S. E. and EAST along the land; during the summer months (May to November) with southerly weather it is supposed to run to the N. W. and WEST. As you are constantly in the influence of the tides you will find it very variable at all seasons.

You will now enter the Gulf of Tehuantepec, and if in the summer or rainy season, you will shape your course for the coast of Guatemala if bound for San Jose; or for Cape Blanco, if to Panama *via* Point Arenas.

If bound to Panama direct you may from Tartar Shoal shape a course about E. by S.  $\frac{3}{4}$  S. direct for Montuosa Island; and in the months of May, June, July, August and September, I prefer so to do as you avoid the heavy rains and squalls found closer in shore.

You will find it necessary to keep more to the southward, say E. S. E., after the first day, as you will from that time until passing Cape Blanco experience a strong N. W. or W. N. W. current. Of this current I will speak farther on.

In the winter season (from October to April) you will haul up round Port Sacrificios towards the head of the Gulf; the object being to keep under the lee of the land, in smooth water, in case it blows from the northward.

I would here remark that, a gray mist hanging over the mountains and a red sunset,—the red extending toward the zenith,—are sure indications of a norther; and if on entering the Gulf, either from the eastward or westward, you meet with a north-westerly swell, a norther will surely follow. Sometimes double-headed clouds are seen to the northward, with clouds or mist

hanging over the tops of the mountains; at others it will blow a fresh gale without a cloud in the sky. The barometer does not indicate them, nor does the temperature of the water.

These winds commence from the N. E. or N. N. E., veer round to the northward, and as you advance into the Gulf, veer to the N. W., and finally die out at west as you approach the coast of Guatemala.

It is generally believed that they are the continuation of the northerns from the Gulf of Mexico. I do not agree in this opinion.

From Sacrificios to Ventosa you can follow the land at a distance of a mile. The whole coast between these points is put on the chart about four miles *too far to the westward*.

Estrete Island lies in lat. 15° 58', long. 95° 29'. It is a large white rock.

In about lat. 15° 59', long. 95° 20', is a remarkable Sand Down, a high bluff, visible a long way. It is about sixteen miles from Point Ventosa, and the first after passing Sacrificios, though there are one or two between it and Salina Cruz.

About half a mile off the first bluff to the N. E. of Estrete Island, and between it and the Sand Down there is a rock awash, the only known outlying danger.

Point Ventosa is in lat. 16° 10', long 95° 08'. It is a high, sandy point, and cannot possibly be mistaken, as it is the last of the high land. East of Ventosa the land is very low. This point (called the Morro) divides Salina Cruz from Ventosa Bay. Salina Cruz may be known by a village on the western side of the bay, and the ruins of a large building of a reddish color, on the side of a hill to the right of the huts. It affords a better anchorage than Ventosa.

On Ventosa Point is a tolerably high stone tower, roofed in, and with windows near the top—near the tower a flagstaff. This tower cannot be seen to the west of north. As you pass the point going east it comes into view.

Back of Ventosa is a high flat-topped mountain, and on a mountain to the left a large rock resembling a house.

If you will keep close enough to the shore I do not see how it is possible to miss the point, but you will know when you pass it, for while to the westward the water is very deep, to the eastward you have regular soundings.

I have sounded twenty miles east of Point Ventosa in sixteen fathoms, green sand, four miles off shore; and six miles east in

\* seven and a half fathoms, fine black sand, two miles off shore; in seven fathoms, with a southerly wind, you will feel the ground swell. The water here is very green five miles off shore.

From Ventosa Point the land trends about E. by N. to Tonala Bar.

About 12 miles eastward of Ventosa Point, in lat.  $16^{\circ} 15'$ , long.  $94^{\circ} 56'$ , you will see a village, and a large church with a white cupola; and about nine miles east of this another similar church and cupola, in lat.  $16^{\circ} 14'$ ; long.  $94^{\circ} 47'$ , and two or three miles east of this last still another.

These churches, with their *white* cupolas, are very conspicuous, and are all back of the beach.

In lat.  $16^{\circ} 13'$ ; long  $94^{\circ} 37'$ , is a remarkable hill or morro, marked with white strips of sand. High land back of it, and moderately high bluffs to the right and left, with *very* low land intervening. A couple of miles to the westward of the morro is San Francisco Bar, an entrance to the lagoon which lies back of all this beach.

There is a village on the beach at or near San Francisco Bar, in lat.  $16^{\circ} 13'$ ; long.  $94^{\circ} 40'$ , and there are many detached huts along the beach.

All this coast, from Ventosa to Tonala Bar, is laid down about two miles too far *to the northward* on the chart; and, I repeat, is *very low*, with high mountains back of it.

I do not know the exact longitude of Tonala Bar, but think the chart is pretty correct. The Bar is said to extend a few miles out, so I would advise your giving it a berth of four miles. At all other points, from Ventosa to Acajutla, you can run along three miles from the shore with the utmost confidence.

The currents in the Gulf of Tehuantepec are very variable. At some distance from the land I have generally experienced a north-easterly set; near the land I think the current sets to the S. W. on the west coast, and S. E. on the coast of Guatemala. This, however, is by no means always the case.

#### CROSSING THE GULF OF TEHUANTEPEC.

In the foregoing directions I have supposed you to keep close along the shore of Tehuantepec on your downward trip, during the season of the northerers. This is not, I think, the best plan. I have generally, after passing Point Sacrificios, steered directly across

the Gulf—say E.  $\frac{3}{4}$  N.; then, in case of a norther setting in, keep the ship off so as to bring the wind and sea one or two points *abaf* the paddle box, and make a run of it. Should you have to keep to the southward of your course—say S. E.—you may still be *sure* that the wind will veer to the northward and westward, enabling you to haul up gradually on your course; and as you get over to the coast of Guatemala, it will veer more and more to the westward until it dies out. This is a better plan than to haul up to the northward in order to get under the lee of the land, [always supposing that your ship is not very heavily laden], and it is surprising what good weather our ships make of it.

I have seen the Colorado, in a hard gale and very heavy sea, running nine knots, with the wind and sea brought two points abaft the paddle-box, and not rolling a streak, or straining in the slightest degree.

This has been my practice during the last four years, during which time I have never received damage of any kind other than my carpenter could repair—perhaps knocking up the planking of the lower guards, purposely lightly nailed down to avoid straining the guard-beams; but nothing more.

If you haul up, you lose time, and go butting into a head sea, as I think unnecessarily.

This applies only to the *down-trip*. When bound up, you must keep close to the Guatemala coast and follow round the Gulf shore close to. The wind then is constantly hauling *ahead*, and you cannot make a run of it. You will find that, after passing Soconusco Bluff in a norther, the wind will frequently die out, tempting you to run across, but it will be pretty sure to freshen up again before you have gone far. The better plan then is to continue to hug the coast; remembering what I have said about Tonala Bar.

If it should be blowing a norther at the time of passing Point Sacrificios, then I would advise your going up at least as far as Estrete Island, keeping a mile or two off shore.

#### THE COASTS OF GUATEMALA AND SALVADOR.

We now come to the coast of Guatemala, which is low and without other marks than the villages. The soundings off the coast are regular, and no known danger exists at a greater distance than one mile off shore. Indeed, in my many trips up and down this coast, I have never seen it break off the shore, nor have I seen any

indications of shoal water. The whole coast, from Tonala Bar to San Jose, can be run at a distance of three miles in about seven or eight fathoms water; between San Jose and Acajutla the shore is bolder, and you will find the same water a mile off shore. Indeed, off San Jose and a couple of miles to the eastward, I have sounded in ten fathoms half a mile off shore, and in fifteen fathoms two-thirds of a mile off; bottom, black sand.

You should not go inside of seven fathoms, and you must remember to use the lead.

The low land extends back some fifteen or twenty miles to the mountains. There are numerous volcanoes, but as they are generally obscured by clouds, bearings cannot often be obtained. It is much better to trust to the villages on the coast for your position.

The volcanoes, Agua and Fuego, are useful in determining your position when running for San Jose from the southward, as by a single bearing you can determine whether you are east or west of the Port, which is all you want to know.

The whole western coast of Guatemala is laid down on the chart some ten miles too far to the eastward; a very serious mistake, as you will readily perceive.

I propose giving the positions of the villages from Soconusco Bluff to Acajutla, and thus to indicate the coast-line.

Soconusco Bluff is a high point, in lat.  $15^{\circ} 54'$ ; long.  $93^{\circ} 39'$ . Just back of it in the interior, is a volcano 5000 feet high by my measurement, and when bearing about north shows a double or treble peak. This *may* be the Soconusco volcano, but if so, it is very much out on the chart.

Following the coast you will pass several huts in latitude  $15^{\circ} 12'$ , longitude  $92^{\circ} 55'$ .

The village of San Benito is in latitude  $14^{\circ} 48'$ , longitude  $92^{\circ} 30'$ .

Vessels go here in the dry season to load hides and India Rubber.

The next village is Champerico, in latitude  $14^{\circ} 20'$ , longitude  $91^{\circ} 57'$ , 76 miles from San Jose.

It is to be recognized by a large white house and *white flag-staff* and a number of huts. During the dry season many vessels load coffee here, and I have seen them anchored close in to the shore. Should you desire to anchor here, you have only to run for the flag-staff and *feel your way with the lead*.

About twelve miles from Champerico is the village of St. Louis, in latitude  $14^{\circ} 13'$ , longitude  $91^{\circ} 47'$ .

This is, also, an Embarcadero, and you will find vessels at anchor. It is known by two large sheds (probably storehouses for coffee), with huts on either side.

About twelve miles further on is the village of Cecegapa, in latitude  $14^{\circ} 06'$ , longitude  $91^{\circ} 38'$ , known by a collection of huts and a large shed, two miles to the S. E. I have sounded here in six-and-three-quarters fathoms; black sand one-and-a-half miles off shore.

The next village is San Jeronimo, in latitude  $13^{\circ} 52'$ , longitude  $91^{\circ} 16'$ , 26 miles from Cecegapa.

It is a collection of huts just back of the rise of the beach, and it is important that you should carefully mark its position on your chart as it is situated near the turn of the coast to the eastward. That is, it is the point where you will haul up for San Jose, and in dark nights you must feel your way with the lead to be sure of not hauling up too soon. This village is twenty-six miles from San Jose; and six miles to the eastward of it is one large shed (no other houses near it), and off which I have seen vessels loading. One or two miles to the westward of San Jeronimo is a grove of cocoa-nut trees.

From San Benito to San Jeronimo the direction of the coast is about S. E. by E.  $\frac{1}{2}$  E., and from San Jeronimo to San Jose about E.  $\frac{3}{4}$  N.

Having hauled up E.  $\frac{3}{4}$  N.—say 2 miles from San Jeronimo—you may run for San Jose, keeping at the same distance from the shore. If there are vessels at anchor off San Jose you will first see them, otherwise you will make on your port bow a large white house, easily seen 10 miles, sometimes more. As you approach you will make out a long wharf extending into the sea, with launches moored off it. There is a buoy belonging to the Panama R. R. Co. off this wharf, and you have only to keep this buoy a little on your port bow, round to off the end of the wharf, one hundred yards outside of the buoy, and anchor in nine-and-a-half or ten fathoms of water and you will then be about one-third or one-half mile from the end of the wharf. Do not go to the buoy as it is rather close in.

You will find tolerable holding ground, generally mud and sand. The Commandanté informed me that there is thirty-one feet at the end of the wharf, and seven-and-a-half fathoms at the buoy at low water, but you should not go in less than nine-and-a-half fathoms.

At this anchorage the flag-staff on the Custom-House [large

white house spoken of] is in one with the end of the wharf, and will bear about N.  $\frac{3}{4}$  W.

Before anchoring, however, having observed in what direction the current is setting, you can anchor to the eastward or westward of the wharf according as you have freight to land or receive; the object being to give the *loaded* launches the benefit of the current.

The wharf at San Jose is built with iron screw piles, and is, I believe, nine hundred feet long. All freight is put into the boats or taken from them by cranes at the end of the wharf, outside the breakers. A railway runs from the Custom-House to the end of the wharf, with cars moved by hand.

There are many launches here and the Captain of the Port sends them off as soon as you anchor.

San Jose is in latitude  $13^{\circ} 53'$ , longitude  $90^{\circ} 49'$ .

There is a light here *on top of the Custom-House*, (not in the Lighthouse at the end of the wharf,) *but it cannot be depended on*. I have never yet found it lighted when making the port at night. I believe it can only be seen five or six miles at best.

As a general rule no work is done at San Jose (nor at Acajutla nor Libertad) at night. Leaving Acapulco for the former place, if you find it impossible to reach there before night, it is better to slow down, and aim to reach there at daylight. In this way you economize in coal, avoid unnecessary risk, and save yourself much anxiety.

If the weather is good, however, and the night moonlight, they will sometimes work, as the last time I was there under these circumstances, I took in eight hundred and ninety-eight sacks of coffee and one hundred and ten of sugar, between 6 P. M. and 7 A. M., detention thirteen hours, working two launches.

In the rainy season it may be better to anchor a little further out from San Jose, but you will be governed by the weather. A south-easter brings in a heavy sea, and sometimes communication is impossible. This whole coast is at that season subject to very violent squalls of wind and rain, attended with heavy thunder and very vivid lightning. These squalls are called *Chubascos*.

#### CURRENTS.

No reliance can be placed on the set of the currents on this coast. Off San Jose it will sometimes run west for three days, and then east for the same length of time. I have been set in

both directions at different times when running for the anchorage from the southward. I think generally the easterly set prevails.

When approaching the coast from the Gulf of Tehuantepec you will frequently be *set in towards the shore*, and you must be on the lookout for this, particularly in dark nights. Keep the lead going. I have been set to the eastward a knot or more an hour from the Gulf to San Jose.

When making this anchorage from the S. E., the only safe way is to be sure and make the land to the eastward of the port. The bearing of Agua Volcano is of great assistance to you here, if it can be taken.

There are numerous rivers on the west coast of Guatemala, principally small and with dangerous bars at their mouths. The mouths are indicated by clumps of mangrove trees. I have never attempted to locate them as it is almost impossible to distinguish them.

#### SOUNDINGS.

As I have previously remarked the coast about San Jose is bolder than that to the westward and N. W. Near San Jose you have ten fathoms half a mile off shore; while off Cecegapa you have but six and three-quarters one and a half miles off.

I have sounded nine miles west of Acajutla in seventeen fathoms, three miles off shore—bottom mud.

You will find *mud, black sand, sand and mud, and sand and shells* along this coast. I have an idea that off the northern villages (San Benito and Champerico) the bottom is *mud; sand and shells* S. W. of Cecegapa and San Jeronimo; *fine black sand or clayey sand* off San Jose; and *mud* again towards Acajutla. This is not by any means certain; I only offer it as a suggestion.

The old Port of Istapa lies about seventeen miles to the eastward of San Jose. The only mark to it is an old tower, overgrown with foliage, probably the remains of a public building. This tower is in lat. 18° 54', long. 90° 33', and is a good mark when running for San Jose from the eastward.

[NOTE.—This position differs very much from the latitude and longitude assigned to Istapa by Imray; but if you will take the bearings as given in his text, you will find they agree with my position.]

In order now to draw the coast line, if you will from Tonala

Bar, draw a line through a point in lat. 16°, long. 93° 44', then through Soconusco Bluff, San Benito, Champerico, St. Louis, Cece-gapa and San Jeronimo, you will have the western coast; thence E.  $\frac{1}{4}$  N. to San Jose, about along the parallel of 13° 52'.

From San Jose E.  $\frac{1}{4}$  N., to a point in lat. 13° 54', long. 90° 33'; thence E. by S.  $\frac{1}{2}$  S., through points in lat. 13° 52', long. 90° 27'; lat. 13° 48', long. 90° 16'; lat. 13° 45', long. 90° 08'; lat. 13° 42', long. 90°, and so to Acajutla.

From Acajutla to Libertad, the chart of Sir Edward Belcher is nearly correct.

This will give you a very close approximation to the correct coast-line, from Tonala Bar to Acajutla, a distance of about three hundred and fifteen miles.

The Custom-House at Acajutla, is in lat. 13° 35', long. 89° 48 $\frac{1}{2}$ . Imray's "Sailing Directions" gives the necessary information in regard to the anchorage. Do not anchor in less than ten fathoms water.

The reef off Point Remedios does not probably extend more than two miles, but you had better give the Point a berth of four miles.

The new wharf lies more to the eastward than the old landing place. There is a large white house covering it. Boats are unloaded by cranes as at San Jose.

Observe what Imray says in regard to the Volcano Isalco. This is the mark for the Port. Remark that *winter* in the "Sailing Directions" refers to the rainy season; what we call summer.

During the coffee season you will always find vessels here at anchor.

The *current* is said to run here always to the eastward, but this I know is not the case. Perhaps in the dry season it generally runs to the east, but at all times you will find it variable.

I am informed that when a steamer is expected, the Captain of the Port puts a light up; *but do not trust to it!* The Volcano Isalco, always burning, is the best light. Bring this to bear N. E. by N., stop in twenty-five fathoms, and await daylight.

The Port of Libertad lies in lat. 13° 30', long. 89° 16', according to Belcher's chart. Imray has the necessary directions for this anchorage.

There is a wharf as at Acajutla. All other remarks apply as at San Jose and Acajutla.

both directions at different times when running for the anchorage from the southward. I think generally the easterly set prevails.

When approaching the coast from the Gulf of Tehuantepec you will frequently be *set in towards the shore*, and you must be on the lookout for this, particularly in dark nights. Keep the lead going. I have been set to the eastward a knot or more an hour from the Gulf to San Jose.

When making this anchorage from the S. E., the only safe way is to be sure and make the land to the eastward of the port. The bearing of Agua Volcano is of great assistance to you here, if it can be taken.

There are numerous rivers on the west coast of Guatemala, principally small and with dangerous bars at their mouths. The mouths are indicated by clumps of mangrove trees. I have never attempted to locate them as it is almost impossible to distinguish them.

#### S. ENDINGS

As I have previously remarked the coast about San Jose is broken off to the westward and N. W. Near San Jose you will find one-half a mile off shore; while off Ceeegapa you will find three-quarters of a mile off.

Off the coast one-and-a-half miles west of Asintla in seventeen fathoms, the bottom is sand and mud.

Off the coast one-and-a-half miles west of Asintla in seventeen fathoms, the bottom is sand and mud. I have an idea that off the northern coast of the Gulf of Nicoya, the bottom is sand and mud. Off the coast of Asintla and San Juanito, the bottom is sand and mud.

Off the coast one-and-a-half miles west of Asintla in seventeen fathoms, the bottom is sand and mud.

Off the coast one-and-a-half miles west of Asintla in seventeen fathoms, the bottom is sand and mud.

Off the coast one-and-a-half miles west of Asintla in seventeen fathoms, the bottom is sand and mud.

Bar, draw a line through a point in lat. 14°, long. 99° 44', then through Socomasco Bluff, San Benito, Chameperlos, Rio Lente, Coangapa and San Jeronimo, you will have the western coast; then to E.  $\frac{1}{2}$  N. to San Jose, about along the parallel of 13° 52'.

From San Jose E.  $\frac{1}{2}$  N., to a point in lat. 13° 56', long. 97° 28', thence E. by S.  $\frac{1}{2}$  S., through points in lat. 13° 52', long. 97° 27', lat. 13° 48', long. 97° 14'; lat. 13° 45', long. 97° 14'; lat. 13° 42', long. 97°, and so to Acapulca.

From Acapulca to Liberal, the chart of Mr. Edward Belcher is nearly correct.

This will give you a very close approximation to the correct coast-line, from Tonalá Bar to Acapulca, a distance of about three hundred and fifteen miles.

The Coast-Route to Acapulca is lat. 13° 30', long. 97° 00'. Inney's "Sailing Directions" gives the necessary information in regard to the anchorage. Do not anchor in less than two fathoms water.

The reef off Point Benito does not generally extend more than two miles, but you had better give the Point a berth of four miles.

The next chart then comes to the westward from the 13° 30' bearing place. This is a long-while place coming in. Bear westwardly towards the shore.

Observe that Inney very rightly says "Tonalá Bar". This is the name for the Point Benito Bar. In the "Sailing Directions" refer to the name as "Tonalá Bar".

During the afternoon you will always find room to go to sea.

The correct Spanish name for the coast-line is the "Costa del Océano Pacífico". This is the very name I used in the original manuscript.

It is the name of the coast-line from the Tonalá Bar to the Point Benito Bar.

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## LEMPA SHOAL.

This Shoal, according to Captain Dow of the Panama R. R. Co's service, lies in lat.  $13^{\circ} 07'$  four miles off shore, and is about sixty miles eastward of Libertad.

From Libertad to Cape Blanco you have the charts of Sir Edward Belcher. I suppose the charts to be only partially correct.

The Gulf of Fonseca and the Harbor of Realejo (Corinto) have been well surveyed

Supposing that you are bound from San Jose to Point Arenas, direct, you will shape a course for Cape Blanco—say about S. E. by E.  $\frac{1}{2}$  E.

The first day out you will probably have a current setting you about E. N. E., after that, and until up with the Cape, you will have a very strong adverse current setting you at first *West* or *W. N. W.*, then *N. W.*, and as you approach Point Gilones (Morro Hermoso on Belcher's chart) *N. N. W.*

I have known this current to run at the rate of two knots or more an hour, and on one occasion was set fifty miles to the *N. W.* in twenty-four hours.

During the winter you will experience strong north-easterly winds out of the Gulfs at Fonseca and Nicaragua. These winds are called *Papagayos*.

Point Gilones (Morro Hermoso) is in lat.  $9^{\circ} 56'$ , long.  $85^{\circ} 38'$ , and it is about thirty-eight miles from Cape Blanco. There is a reef lying off this point extending, according to Belcher, one and a quarter miles. I do not think it extends beyond half a mile, but you may as well keep two miles off shore.

From this point to Cape Blanco the course is about S. E. by E.  $\frac{1}{2}$  E. Cape Blanco is improperly laid down on Imray's charts. It should be nine miles to the eastward; and this is the case with both coasts of the Gulf of Nicoya, Cano Island, and the coast from Point Llorena to Cape Matapalo. Belcher's sheet charts are the ones to run by from Cape Blanco to Panama. You may rely upon their correctness.

You will find on Imray's chart of Central America a plan of the Gulf of Nicoya, and if you do not happen to have Belcher's chart, you may use this with safety after taking your departure from Cape Blanco; for, although the Cape is laid down too far to the westward, yet, as the opposite coast is laid down in the same manner, *the relative bearings and distances are correct*.

Having rounded Cape Blanco at a distance of one mile, you will, if bound into Point Arenas, steer about N. E.  $\frac{1}{4}$  N. for Sail Rock. The "Sailing Directions" are very accurate, and you will find no difficulty in making the anchorage. If at night, pick up Jasper Island, which is higher than the Nigretas; and if *very* dark, be sure and give Sail Rock a berth, as it is not very high, and cannot be seen far. If you make the Light after passing Sail Rock, you have simply to bring it to bear N. N. W., run for it, and anchor in five fathoms water, sandy bottom.

If you do not make the Light [and it cannot be depended on], run over and make Calderas Bluff and coast along in six fathoms until off the village; then anchor in five fathoms. In the day-time you have only to run for the end of the wharf (now building) a little to the right of the Lighthouse.

When off Calderas Bluff, with the Light bearing about N. W. by W.  $\frac{1}{4}$  W., seven fathoms water, you will see bearing about W. N. W. a bluff point, and to the right two remarkable hillocks. The Light is inside of the point and (on this bearing) to the right of the hillocks. As you approach, the hillocks appear to the right of the Light.

This is the best mark I know for picking up the anchorage when the Light cannot be seen.

Calderas Bluff is not the first high point, but it is three miles N. N. W. of it. The first bluff is the best defined—no name on chart—eleven miles from the Light.

By running close to Calderas Bluff and then coasting it, you avoid the shoals; and if there are vessels here they will show clear of the point. These hints are only intended for nights, as by day there is not the least difficulty in making this port.

In running for the port from the eastward you will pass Cano Island [the S. E. island of that name in lat. 8° 40'] two miles distant, and steer about N. W. for Cano Island No. 2. At a distance of thirty miles by day, if the weather is clear, you will see Cano Island lying off a high mountain, with a slight break or gap between, and at the same time Point Mala or Judas will be seen to the right, a low point under the mountain. About this time you will have Point Quepos abeam, distant twenty miles, and can get a fresh departure. This point looks like a saddle, and is easily recognized.

You will now see also high land a little on your port bow, and perhaps Cape Blanco broad on the port bow.

If a dark night, do not try to make Point Mala, but keep on until you see the point off which Escollo Rock is marked, called Point Guapilo by Imray. This is a bold high bluff, and readily known. Then you will make Cano Island, also a high well-defined bluff.

Cano Island is the best mark for the anchorage. It is bold-to, and cannot be mistaken; when abeam it resembles a haystack.

After this you will make Herradura Point, and still to the left Point Sucia.

Pass Cano Island, two and a half miles distant, and when Herradura is abeam steer N. by W.  $\frac{1}{2}$  W.

There is a reef off Point Mala and another off Point Guapilo, but you will see by a simple inspection of the chart that you cannot strike Point Mala Reef while Point Guapilo is on your starboard bow, nor the rocks off Point Guapilo while Cano Island is on your starboard bow; only be careful not to bring either point ahead. The reef off Point Sucia is out of your track.

In picking up Cano Island at night you may run with the utmost confidence if you have been careful to keep the run of your ship, for you have departures, successively, from Cano Island No. 1, Point Quepos, Point Mala and Point Guapilo. This should always be done, and is essential to running a steamer properly.

If you will pay attention to this rule you will never mistake or run by your port; and remember that in making any of these ports from the eastward you must *keep the starboard hard aboard*, and *vice versa*. Do not "let go" of the land; the darker the night the more essential it is to keep hold of it.

Having passed Cano Island and hauled up as directed, run until you make the Light, which will be at a mean distance of six miles; or if you do not make it, run for Calderas Bluff and proceed as before.

In the dry season there will be many fires on the land; be careful not to mistake them for the Light.

The tides at Point Arenas are regular. The flood sets *N. E.* and *North* from Cape Blanco, then *N. W.* and at the anchorage *west*. The ebb in the contrary direction.

It is said that off Herradura Point the flood sets over to the westward, probably *N. W.* On the western shore I know that it sets you in to the land. You will find strong tide rips off Sail Rock.

You should always calculate the time of high water at Point

Arenas when bound there, so as to know how you will be set in going up the Gulf.

The shoal marked on the chart as lying S.  $\frac{1}{2}$  W. from the Lighthouse, extends, I think, more to the westward than laid down. When you are at anchor in five fathoms off the wharf the extremity of the shoal lies off somewhere about S. W. by S. from you.

When coasting along then from Calderas Bluff in five or six fathoms of water, and no lights to be seen, *you must be careful not to pass the Lighthouse or you will be on the shoal before you know it.*

When in doubt, anchor and await daylight.

The freight is sent off to you here in launches, and only on the ebb tide, unless there is a strong favorable wind. If you do not receive the whole of your freight on one tide you must await the next. The launches come down the creek (visible over the low land) and around the shoal.

The last time I was here I received by the first tide 8,478 sacks of coffee, in eleven launches. Some large, some small. Freight is sent off by night as well as by day.

Should you have freight to land you will indicate the number of tons with Rogers' Signals at the foremast head, so that the proper number of launches may be sent off.

They are now building a wharf out from the shore, a little to the eastward of the Lighthouse. When this is finished, freight will be handled very rapidly at any stage of the tide.

There is not the least difficulty in leaving Point Arenas in the darkest nights; pass Sail Rock and steer a course.

From Cape Blanco to Panama direct, you will steer to make Cano Island, about S. E. by E.  $\frac{1}{2}$  E. This is a moderately high island, very level on top and about a mile long. You can run with safety two and a half miles from it.

If you leave Cape Blanco with the flood tide, you may make the island on your starboard bow. The ebb, on the contrary, will set you off. In dark, rainy weather then, you should calculate the time of high water so as to run knowingly.

The coast from Cano Island to Burrica Point can be run within two miles. There are no dangers outside of the Corcovado Reef which shows well above water.

From Cano, however, you will shape a course for Montuosa

Island, taking fresh departures from Sal-si-Puedes and Burrica Point.

The tide frequently sets very strong to the S. E., along this coast, and after passing Burrica you will be set in by the flood, and may make Montuosa on the starboard bow. You should calculate the time of high water at Point Arenitas, Gulf of Dulce.

The establishment of this port, as well as that of Point Arenas, is about the same as that of Panama, consequently the tide-tables, for the latter place, will answer approximately for all.

Montuosa Island is, by my observations, five hundred feet high, and looks like a cocked-hat. The edges are sharp and well defined, and it can be seen in the darkest night:—by day, thirty miles distant. Reefs extend to the N. W. and S. E., but you can run within three miles of it, with safety, and then haul up about E. S. E. for Hicarita Island, which you can pass close-to, one-quarter mile if desired.

From Hicarita you will run about E.  $\frac{1}{4}$  N. for Point Mariato. It is sometimes difficult at night to make out the exact location of the point, but you can generally see when Naranjas Island is abeam, and twenty minutes run brings you to Point Mariato.

From Mariato you will keep, say two miles from the land to Point Puercos. There is a reef, four miles to the westward of the latter point, and you must be careful not to haul up too soon. At night, if you do not see the breakers on the reef, its position is indicated by a gap (low land) back of it.

Point Puercos is high and can be passed, say one mile off. Then haul up and pass between the Frailes, if you can see, but if it should be very thick and rainy, steer so as to give the South Fraile a good berth; then haul up for Cape Mala, and when that is abeam steer N. by E.  $\frac{1}{2}$  E for Bona Island; pass Bona one mile off, Taboguilla half a mile, round San Jose Rock, close to, and so on close to Perico Island to the buoy at Panama.

In the Gulf of Panama, the current almost always sets to the southward on the western shore. The flood runs up along the eastern shore. From Point Mariato to Puercos Point, the current is generally to the eastward, though not always.

I have often run from our buoy to Puercos Point, at the rate of eleven knots an hour, and then dropped to nine knots from Puercos to Hicarita, then increased to ten knots to Burrica Point or Cano Island.

All along this coast you are within the influence of the tides.

In the dry season, December, January, February and March, you will find strong northerly winds in the gulf, sky clear, but weather very hazy; under these circumstances, Bona will not be seen more than seven miles.

Remember that you should always get hold of this island, as it is but twenty-two miles from the buoy and gives you an excellent departure.

In these winds you should run well to windward of your buoy, send out your boat, and drift down on it. If you fall to leeward you will have to anchor.

In the rainy season a light is sometimes put on San Jose Rock, but this rule is not invariable.

#### FROM PANAMA TO SAN FRANCISCO.

I shall have but little to say about the up trip, as I have mentioned all the marks, &c., so particularly on the trip downwards.

In the summer, if not intending to stop at way-ports, I prefer steering direct from Montuosa Island to Acapulco, as I think you have better weather, certainly less rain. You will, in this case, have a N. W. current from Cape Blanco until near the Mexican coast.

In the winter season, pass Point Gilones three miles, and steer for the coast of Guatemala, about Cecegapa. [I am supposing you bound to Acapulco direct.]

Run this coast at a distance of say three miles all the way to Ventosa, and then down the west coast two miles off to Point Sacrificios.

Do not attempt to cross the gulf direct. Your ship is, probably, deep loaded, and if you are caught out in the gulf in a "norther" you will have a very ugly sea, and there will be nothing for it but to haul up under the lee of the land.

From Sacrificios run to Point Angeles, take a departure from White Rock, and shape a course to round Tartar shoal and so to Acapulco.

From Acapulco run to pass Point Tequepa one mile off; thence to Point Tejupan two miles, and so to Manzanilla.

From Manzanilla run along the coast, taking advantage of the N. W. current, pass the Frailes one mile, and shape a course for Cape St. Lucas, allowing for a northerly set up the gulf.

From St. Lucas run for Cape Tosco, keep close in along Margarita Island, if blowing hard from the N. W. pass San Lazaro two miles, and if still blowing, steer for Asuncion Island, and thence to Natividad, a mile or so off shore. If not blowing, steer about N. W.,  $\frac{1}{2}$  W. direct for Natividad; pass Natividad, Cape St. Augustine and the Benitos three miles, and from the latter take your departure.

On the up trip I have always made it a rule to pass inside of Cortez shoal and make San Clemente Island. You very often have weather here in which you can see fifteen or twenty miles, but a cloudy sky, rendering it impossible to get observations. In such weather if you go outside you must depend upon your dead reckoning to run for San Miguel Island; and should it happen to be foggy you must refuse San Miguel and run for Point Sur; whereas by going inside you have less wind and sea, and when you make San Clemente you know you are clear of the shoal and have a good departure for San Nicolas Island.

In case of fog it is very easy to haul out.

In running for San Nicolas you will frequently have here an easterly current, so if you haul out in a fog give it a wide berth, at least twenty miles, unless you are very sure of your position.

San Nicolas lies more east and west than laid down on the chart. After getting the S. E. point abeam two miles, you had better, if at night, steer about W. by N.  $\frac{1}{2}$  N., until you have the N. W. point abeam, then haul up for San Miguel, pass it two miles, Richardson's Rocks one mile, and if good weather, shape a course for Point Sur.

In strong N. W. winds, I think the better plan is to pass between Santa Cruz and Santa Rosa, then to Point Concepcion one mile off. You leave San Nicolas on your port hand in this case, and as you have your exact position at every moment you can haul out in case of fog, and run with certainty to clear San Miguel Island.

In strong N. W. winds and heavy head sea it is well to keep along the coast from Point Arguilla to Point Sur, two miles off, as you have smoother water. In running from Point Gorda to Point Sur, I have frequently observed that N. W.  $\frac{1}{2}$  W. will not carry clear. You will have to keep off, perhaps, N. W. by W. As the chart is probably correct, this may be caused by some ferruginous matter in the soil, drawing the north point of the compass towards it. Whatever be the cause, I have observed that a compass, which

has carried me *off* the land, all the way from Panama, will carry me *on* hereabout.

Having passed Point Sur, one mile, steer for Pigeon Point, Point San Pedro, and so over the bar at San Francisco. As you may be enveloped in fog at any moment, you should run from Point to Point, close to, and keep your reckoning with the utmost exactness.

The "Sailing Directions" are complete and full, and I have nothing to add to them except that I would not advise your hauling in to make the beach in thick weather until you are certainly north of Point San Pedro; and to advise you to keep the lead going. Do not go in less than twenty fathoms water, if you cannot see.

The entire coast from San Francisco to Panama is so clear of outlying dangers that a stranger can make the voyage with safety by keeping seven or eight miles off shore—say so as just to see the breakers from the deck.

Imray's "Sailing Directions" contains much valuable information on this subject, and I do not wish it to be understood that these remarks are to supply its place. *They are to be read in connection with Imray.* Many points I have not touched upon, as they are much better described by him.

#### Fogs.

In all that I have written I have supposed you to have *clear weather*; if, on the contrary, you should leave San Francisco *in a fog*, you should steer so as to pass Pillar Point twelve miles, and then shape a course to pass twenty-five miles outside of San Miguel Island—this will carry you constantly off the land. Should the fog hold on so as to prevent you seeing San Miguel, continue on, giving Cortez Shoal a berth of thirty miles, and, if it still does not clear, give the Benitos and Cape San Lazaro a birth of thirty-five or forty miles. Then haul in to make Cape St. Lucas.

It is not at all likely that the fog will continue so long. I only wish to impress upon you the importance of *never running an unnecessary risk*.

Remember it is not at all *necessary* that you should make the land. You may run all the way to the "Frailes" or Navidad Head without doing so, unless ordered to stop at Cape St. Lucas. I have never seen a fog at the latter point, nor do they prevail S. E. of Cerros Island.

If ordered to touch at Magdelena Bay, *nothing will justify you in attempting it in a fog.* There are no soundings off San Lazaro or Point Entrada, and you should never run for a point in foggy weather unless *you have the lead and soundings to assist you.*

This rule is general. *Never trust to seeing in a fog.*

On the up trip, the safety of your ship and your arrival on time depend upon your keeping hold of the land, and taking frequent departures. After leaving Point Sur, if it sets in foggy, steer twelve miles clear of Pigeon Point. Of course you can run closer to the land when you have a recent departure—in other words, when you know the *exact position of your ship.* Sound off Ano Nuevo and Pigeon Points, then haul up to pass ten or twelve miles clear of San Pedro, and keep the lead going.

The lead will tell you how far off the land you are, and whether you can haul in.

The object is to keep as near the land as is consistent with safety, so if it lights up for a few minutes (as it will often do) you can get hold of the land and verify your position.

This object can only be obtained by keeping the exact run of your ship before the fog sets in.

I shall recur to this subject again, but I repeat here:

*Never trust a fog.*

*Never run an unnecessary risk.*

## 2. SAILING DIRECTIONS FOR VARIOUS PORTS.

[*These remarks are only intended as supplementary to Imray's Sailing Directions.*]

Having described the ports at which we touch pretty fully, I only propose to give a few hints on making them; giving the marks, &c., particularly for night.

1. *Magdalena Bay.*—In entering this bay keep over towards Point Entrada. The best anchorage, at all seasons, is probably abreast the spot marked "Obs'y" on Belcher's Chart, about seven miles N. W. from Point Entrada. To reach it you have only to follow the land around from the Point, at a distance of three-quarters of a mile and anchor in ten or twelve fathoms water.

During the prevalence of northerly winds the best anchorage is, perhaps, at the head of the bay. It is here I have generally seen whalers at anchor. To reach it, run about N. by E.  $\frac{1}{4}$  E. from the

entrance to the harbor, and anchor in seven or eight fathoms; observing not to bring Point Entrada to the eastward of S. by W.  $\frac{1}{2}$  W. This will insure your being clear of Dupetit Spit.

The anchorage on the eastern side of the bay, towards Mangrove Island, is more exposed to the winds.

At present, when we have passengers for Magdalena Bay, they are met by a boat off Point Entrada. It is not yet determined where the anchorage for our steamers will be when we enter the bay. This will depend upon the permanent location of the colony.

There is not the least difficulty in entering the bay by day or night. You will, of course, keep the lead going.

2. *Manzanilla* —In making Manzanilla from the westward, it is better to get hold of the "Frailes," then Navidad Head; Cape Graham and White Island—passing about one mile from these points. The only out-lying danger is the Sister Rock, about a half mile off Gowland Point. If very dark or thick, you can easily make sure of avoiding this rock by keeping over towards the starboard shore—run five miles from White Island and then haul up, bringing the Sugar Loaf (Vigia Chico) on your starboard bow; as you pass this, close to, you will open the lights of the town. Should there be no light on the buoy, you will find it by steering (about E. by S.  $\frac{1}{2}$  S.), directly for a high peak with which the buoy is in line.

Bound into Manzanilla from the eastward, you should pass Point Tejupan at a distance of two miles, and verify your position by taking the time when Black Head is abeam. You have then but forty-two miles to run to Manzanilla Point, and there is nothing to excuse your running by the harbor. Manzanilla Point is a bluff headland, and you will be sure to see it if you keep *close enough* to the shore. Sail Rock will make out to the left of the point, unless you are set off, in which case it will be *on* with the point and cannot be seen.

Pass one-third of a mile from the rock and point and follow the land round with a port-helm to your buoy. It is all a bold shore.

Captain Richards' Chart is an excellent one, and you will find no difficulty whatever in entering this port by day or night.

On this chart there is a rock awash, marked about seven-eighths of a mile S. E. of the outer rock off Navidad Head. I think this rock lies about one-quarter mile S. W. of the reef.

3. *Acapulco*.—Making this port from the westward, take your departure from Point Tejupan and White Rock Point, and steer for Morro Petatlan. Pass this point at a distance of two miles, and Point Tequepa one mile. Run along the beach one-and-a-half miles off, verify your position by taking the time when the bluff twenty-nine miles from the buoy is abeam, and again by the ridge and peak eighteen miles from the buoy. The light can be seen twenty-five miles in clear weather and will make a little on your port bow. Pass one-third of a mile from Griffon Island, and with starboard helm follow round to your buoy, keeping close to Griffon Point.

The only out-lying danger is the rock lying N. E. by E.  $\frac{1}{2}$  E., three-eighths of a mile from the outer edge of Griffon Island, in a line with Point Guitarron. If very dark you can steer about E. N. E. [heading about for Point Bruja] until Point Griffon is abeam—then haul sharp up for this point and you will clear the rock whether you see it or not.

You will be pretty sure, however, to see the breakers on it.

If there is no light on the buoy, steer midway between the two gaps in the land to the right of the Company's coal-sheds and you will find it.

In running for this port from the eastward, take your departure from the white rock off Port Angeles and shape a course to pass just outside of Tartar Shoal; verify your position, and ascertain your rate of speed by noting time of passing Morro Hermoso. Having passed the shoal, haul up about W. by N.  $\frac{1}{2}$  N. for Potrero Point. The current frequently sets strongly to the eastward, and you may be set in with the land about the river—twenty-one miles from the buoy—in this case haul out, and remember what I have said about the trend of the coast hence (about N. W. by W.  $\frac{1}{4}$  W.) to Potrero Point. Should you be about up with the river, and not make the light you may know that you have it *shut in* by the intervening land, and must haul out. When the light bears N. W. by W.  $\frac{1}{2}$  W. run for it, and you will clear Potrero Point.

Pass one-third of a mile from Potrero, haul up and pass close to Bruja Point, and then run across and pass close to Griffon Point, and so to the buoy.

These points are readily distinguished in the darkest nights. There is no difficulty in leaving this harbor at any time.

4. *San Jose de Guatemala*.—I have already given directions for this port. Making it from the northward, be sure and make

the land to the westward, and when coming from the southward, make it to the eastward. In the first case you can verify your position by San Jeronimo, and in the latter by the old Tower at Istapa. If the volcanoes are visible, a single bearing gives you notice whether you are east or west of the anchorage.

When making the port from the S. E. you will notice that the land runs to a point to the westward, and if there are vessels at anchor off San Jose, they will show off the point; run a little inside of the point and you will soon see the custom house and wharf.

Leaving the anchorage at night—bound up—it is best to run about W. by S.  $\frac{1}{2}$  S. for an hour, then W.  $\frac{3}{4}$  S. for two hours, and then on your course, unless you can see the land clearly.

5. *Acajutla*.—In making this port from the westward you can run the coast from San Jose two or three miles off-shore. The low land and beach extend to Acajutla, which is on a moderately high bluff. As you draw near you will make the custom-house and wharf on your port bow, and Point Remedios and Reef, on your starboard bow. The Reef shows well out of water and breakers extend some distance beyond the rocks.

I should say this reef lays more off to the south and S. E. of the point than to the S. W., as marked on the chart.

Acajutla is on a bluff, as I have said, and from the town to Point Remedios there are strips of sand beach showing much whiter than the beach to the westward of the bluff. Back of the town and point the land breaks in moderately high hills, which will be seen when the mountains and volcanoes are obscured. In the dry season there are so many fires on the mountains that Isalco cannot always be distinguished. The land, though, to the eastward is high down to the sea—to the westward low, with many huts on the beach—detached and in groups.

Making the port from the southward you will see the custom-house twelve miles off, with a good glass. Keep four miles off Point Remedios and anchor as directed. In making Acajutla from the eastward, you will open the white house on the wharf as you round Point Remedios. Having cleared the reef, steer about north along the land, until you open the old custom-house clear of the bluff, and having the wharf bearing about E. N. E., run directly for it, and anchor in about ten fathoms water.

The last time I was here I anchored in nine and three-quarters fathoms, sticky bottom, and lying with thirty fathoms of chain

out, with the ship's head to the southward, I took the following bearings:

Old Custom-House, N. E.  $\frac{1}{2}$  N.  
End of Wharf, E.  $\frac{1}{2}$  S.  
Point Remedios, S. S. E.  $\frac{1}{2}$  E.

Wharf distant about three-fourths of a mile, when the ship *steung* with her head to the northward, I had the street leading to the wharf in view.

You keep the old custom-house *open with the bluff* to avoid some rocky patches.

Imray says, bring Point Remedios to bear S. S. E., but this is a mistake, as you would be too close in.

The current sets both east and west. I have sounded along the coast in seventeen fathoms, black mud, three miles off shore.

From Acajutla to San Jose, the coast trends about W. by N.  $\frac{1}{2}$  N. for forty miles, and then W.  $\frac{1}{2}$  S. to San Jose. The direct course from anchorage to anchorage would be about W. by N.

#### 6. LIBERTAD.

According to Imray, Libertad is in lat. 13° 30'; long. 89° 15', and is about thirty-five miles from Acajutla.

It is situated at the base of high hills and mountains, and in a slight indentation of the coast.

In making it from the eastward, it is better to get hold of the land ten or fifteen miles to the eastward, and coast along three miles off. The volcano *Salvador* bears N.  $\frac{1}{2}$  E. from the town, and is the best mark for the port when it can be seen. It is very high, and the peak is seen *back of a high range of mountains*. Volcano *Vincente*, which lies some miles to the eastward, is also very high and shows clear of the adjacent mountains. It is almost a perfect cone.

The coast to the east of Libertad is low with regular soundings. I have sounded forty miles east in twelve fathoms, six miles off shore—bottom green mud; thirty miles east in twenty-eight fathoms, ten miles off shore—bottom green mud; and thirteen miles east in thirteen fathoms, three miles off shore—bottom sand and shells.

Some ten or fifteen miles east of the port, you will see a large white house one-third of the way up the mountains.

There is a large white house covering the wharf, which is very

conspicuous, and can be seen ten miles. You cannot run by the place without seeing it.

In making the port from the westward, the houses and wharf are *shut in* by a point, and you will not see them until nearly up with the anchorage.

When making the port from the southward, if San Salvador volcano cannot be seen, you cannot possibly fail to know whether you are east or west of the anchorage: for while to the east the coast is low and soundings shoal, to the west the land is very high and broken into irregular peaks, which come down to the ocean, (leaving no beach) and the soundings very bold. This formation extends about twenty miles west of Libertad.

To anchor, you have simply to run for the end of the wharf, and anchor directly off it in nine or ten fathoms water.

From Libertad towards Acajutla, the coast trends W.  $\frac{3}{4}$  S. for thirteen miles; then W.  $\frac{1}{4}$  N. six miles; where the low land commences again, and extends to Point Remedios. From the point where the low land commences, the coast trends to the W. N. W., and then again to the W. S. W., forming something of a bight, but if you run from Libertad W.  $\frac{3}{4}$  S. fifteen miles, Point Remedios will then bear W.  $\frac{1}{4}$  N.

Belcher's Chart has the coast line with sufficient exactness.

NOTE.—The volcano, San Salvador, does *not* bear N. N. E. from Libertad as indicated on Imray's Chart.

#### REALEJO (CORINTO).

This harbor is an excellent one, and has been well surveyed.

In running for it from Point Gilones (Morro Hermoso), it is well to steer a little to the eastward of the port. The current sets to the N. W. The last time I made it, the current set me N. W. by W., about one knot per hour; but I think that usually it runs more to the Northward—say about N. N. W.

Should you fail to get observations, *haul in to the Eastward*, make the land, and coast along three miles off.

You will make the "Remarkable Tree," on the N. W. end of Cardon Island, with the *House and Flagstaff* near it, at least ten miles off. This Tree is placed on Belcher's Chart a little way back

of the Point; *but it is on the extreme end, and overhangs the water.*

You will find no difficulty in recognizing Conway Reef and Castanon Bluff and Shoals—in fact, *all* the marks for the harbor.

Run along, steering about N. W., one mile from Cardon Island, in about seven fathoms of water, until you have the extreme N. W. point of the island, bearing E. by S. *Southerly*.

The opposite points of the entrance (Cardon Head and Point Icacos), will then be well open. Steer in E. by S. until Point Ponnicute is abeam [bearing S. by W.], and then haul close round Cardon Head, passing within fifty feet of it. Haul up S. E.  $\frac{3}{4}$  E., or S. E. by E., and stand on until the S. E. end of the Cardon Island bears S. by E.; then steer E. by N.  $\frac{3}{4}$  N., or E. N. E., and round Point Icacos, one cable's length distant. Keep at this distance from the shore until the Custom House is abeam, when anchor in about five fathoms water. Veer a short scope, as you will have but barely room to swing.

The channel abreast Cardon Head is a scant cable's-length in width (not two ships'-lengths), so that *it requires very careful steering*; with strong Southerly winds and heavy rollers setting in, I would not attempt to enter the harbor with a large ship.

After once passing Cardon Island, you will find yourself in very smooth water. Work is done here day and night; but as there is not room to turn a large ship, you will have to wait for the flood tide to swing your ship before weighing the anchor.

It is most prudent to enter and leave this harbor by day.

The coast-line from Corinto to Point Coseguina appears to be pretty correctly laid down on the charts; but from Point Amapala towards Libertad, Imray's Chart puts the coast from twelve to sixteen miles further to the Northward than Belcher's. On the latter the coast is, *I know*, laid down too far to the Southward, but I don't know how much.

On both charts, *Lempa Shoal* is marked in about lat.  $13^{\circ} 01'$ , lon.  $88^{\circ} 16'$ ; but I have run over this position without seeing anything of it.

From all the information I have been able to collect in regard to this shoal, I think it will be safe to keep at a distance of eight miles from the land hereabouts.

8. The other ports between Libertad and Point Arenas, are *La Union, Amapala* and *San Juan del Sur*. I have never entered them with our ships.

Imray gives the necessary information concerning them.

NOTE.—The volcanoes of Central America are incorrectly laid down on the charts. The Sailing Directions, Imray's Chart and Belcher's Chart, *all disagree!*

9. *Point Arenas*.—I have nothing to add to what I have already written concerning this port, except that you will find the *Pan de Azucar* (Sugar Loaf) a good mark.

10. *Panama*.—I have only to add, that if you cannot make out Cape Mala at night, you may get a good departure from Iguana Island.

11. *Mazatlan*.—You will find the Sailing Directions very correct for this Port. I will merely add a few words.

A good berth is in eight or nine fathoms water, with South Bluff—Creston Island—bearing W. by S  $\frac{1}{4}$  S., Black Rock S. S. E., and the Town of Mazatlan N. by W.  $\frac{1}{4}$  W.

To pick up this anchorage from the westward, pass Creston Island, distant one ship's-length, and steer E. N. E. You will then have *Ciervo Island* a little open on your port bow; and when Black Rock is abeam, [S. S. E.] and the Town of Mazatlan two-thirds of a Point forward of the port beam [N. by W.  $\frac{1}{4}$  W.], drop your anchor.

The town will come into view only a short time before it is time to anchor.

To pick up this anchorage from the southward, pass west of Black Rock one cable's-length (two ships'-lengths), and steer N.  $\frac{1}{4}$  W. You will then have the town in view, a little on your port bow. Stand on until Creston Island (South Bluff) is half a point abaft your port beam (W. by S.  $\frac{1}{4}$  S) and the Town of Mazatlan will then be about half a point on your port bow, [N. by W.  $\frac{1}{4}$  W.] when anchor.

In both cases, you must be sure to keep *Monte Silla* well open west of *Ciervo Island*, and you will be certainly clear of Blossom Rock—which is not buoyed.

The above, I think, you will find a good anchorage most of the year, and with the marks I have given, can be taken up with great facility.

Should you wish to anchor closer to the town, you can do so by steering about N.  $\frac{1}{4}$  E. from the position given; but you must keep the lead going, and be sure not to open *Azala Island* with *Pala Point*.

The objection to going too close in, is the difficulty of getting under weigh in a large ship, as there is but scant room for manœuvring.

During the bad season, September and October, you may wish to anchor further out; but you will be governed by the weather and the length of your stay.

You cannot mistake the port—Creston is a small but very high island, running to a sharp point—a very remarkable cone. Ciervo and Gama Islands are very small—in fact, large, conical white rocks.

In running for Mazatlan from Cape Saint Lucas, you cannot do better than to shape a direct course—E. by N.  $\frac{1}{2}$  N. In May, I was set to the northward, .7 knots per hour, wind very light from westward. At other times it no doubt sets to the southward.

Should you arrive off the port at night, you will see the lights of the town to the northward of Creston Island.

In making the port from the southward, having passed Cape Corrientes, three miles distant, you may run with confidence for the *Corvetena*, which lies in lat. 20° 44'; long. 105. 46'. [Imray's Position nearly correct.]

This is a low, white island, about one-fourth of a mile long, from east to west. When bearing east, it looks like a large, white rock. There is apparently a reef extending a mile or so to the S. E. of it.

Imray's description is apt to mislead you. It does not show three peaks when seen from the southward, nor is it black; but white.

There is no island six miles E. S. E. of it, as marked on Imray's Chart. The nearest visible, is a tolerably long and low, white island, at least twelve miles distant. However, all the islands and rocks to the eastward (and you will see several after passing Cape Corrientes), are out of your way.

I found the water much discolored off the *Corvetena*, but it is said to be very bold by those who have sounded here. I have passed it at a distance of two miles, and saw no broken water except a little to the S. E. of it.

*Cleopha Island* is also correctly laid down on Imray's Chart, and affords you a good departure. There is a remarkable *Sail Rock* to the S. E. of it. At night it would not be safe to run for the *Corvetena*, as it is very low. In this case you had better borrow to the westward and make *Cleopha Island*, which is high.

I have never seen *Isabel Island*, but think it is correctly placed on Imray's Chart.

The current between *Isabel Island* and *Mazatlan* is probably generally to the southward.

Off *Mazatlan*, the soundings are very bold. I have sounded with sixty fathoms line—no bottom—fifteen miles off shore.

12. *San Diego*.—Our ships now touch at this port. The Sailing Directions give all necessary information. I give for your convenience some tables of distances.

Under certain circumstances I should prefer running between the Santa Barbara Islands when bound for or leaving San Diego, instead of following the channel. The distance is precisely the same.

13. *Ports of Refuge*.—In running along the coast it is well to read up the Sailing Directions, and observe the marks for each harbor, as San Bartholomew, Sehuantenijo, Guatulco, Salina Cruz, &c., as you might wish to enter them at some time or other.

TABLE OF DISTANCES FROM POINT CONCEPCION TO SAN DIEGO.

	Santa Barbara.	Anacapa.	Pt. Fermín, abeam.	Catalina Is., S. E. Pt. abeam.	San Louis Rey, abeam.	San Diego.
Point Concepcion.....	87	63	116	129	163	197
Santa Barbara.....	.....	26	79	92	126	160
Anacapa.....	.....	.....	53	66	100	134
Point Fermín.....	.....	.....	.....	13	47	81
Catalina Is., S. E. Point.....	.....	.....	.....	.....	34	68
San Louis Rey.....	.....	.....	.....	.....	.....	34

TABLE OF DISTANCES FROM CAPE ST. LUCAS TO MANZANILLA *via*  
MAZATLAN.

	Mazatlan.	Isabel Island	Cleopha.	Corvetena Is.	C. Corrientes.	Frailes.	Manzanillo.
C. St. Lucas.....	196	282	814	348	370	450	491
Mazatlan.....	.....	86	118	152	174	250	291
Isabel Island.....	.....	.....	82	66	88	168	209
Cleopha Island.....	.....	.....	.....	34	56	136	177
Corvetena Island.....	.....	.....	.....	.....	22	102	143
Cape Corrientes.....	.....	.....	.....	.....	.....	80	121
Frailes.....	.....	.....	.....	.....	.....	.....	41

From Cape St. Lucas to Manzanilla *via* Mazatlan, 491 miles.

From C. St. Lucas to Manzanilla direct, 391 miles.

From San Francisco to Mazatlan, 1,327 miles.

TABLE OF DISTANCES FROM ACAPULCO TO PANAMA, *via* SAN JOSE, ACAJUTLA, LIBERTAD AND POINT ARENAS.

	Angels Rock.	San Benito.	Champerico.	St. Louis.	Ceegapa.	San Jeronimo.	San Jose.	Istapa.	Acajutla.	Libertad.	C. Blanco.	Sail Rock.	Point Arenas.	Herradura Point.	Cano Island.	Panama.		
Acapulco	205	443	486	498	510	536	562	579	622	660	961	999	1024	1033	1054	1130	1487	
Angels Rock		238	281	293	305	331	357	374	417	455	756	794	819	828	849	925	1282	
San Benito			43	55	67	93	119	136	179	217	518	556	581	590	611	687	1044	
Champerico				12	24	50	76	93	136	174	475	513	538	547	588	644	1001	
St. Louis						12	38	64	81	124	162	463	501	526	535	556	632	989
Ceegapa							26	52	69	112	150	451	489	514	623	544	620	977
S. Jeronimo								26	43	86	124	425	463	488	497	518	594	951
San Jose									17	60	98	399	437	462	471	492	568	925
Istapa										43	81	382	420	445	454	475	551	908
Acajutla											38	359	377	402	411	432	508	865
Libertad												301	339	364	373	394	470	827
Point Gilones													38	63	72	93	169	526
C. Blanco														25	34	55	131	488
Sail Rock															9	30	106	463
Point Arenas																21	97	454
Herradura Point																	76	433
Cano Island																		357

From Sun Francisco to Panama *via* intermediate Points mentioned 3,300 miles.

## GENERAL REMARKS.

*Currents.*—Along the coast of California the current generally sets to the S. E., but I have never known it to run with great velocity. From San Miguel to the San Benitos and thence to Cape San Lazaro the set is generally to the eastward. In the winter with southerly weather, I have had a N. W. current from the Benitos to San Clemente Island; and at times when close in shore you will find a N. W. current from Piedras Blancas to San Francisco bar. Among the Santa Barbara Islands I think an easterly current prevails.

In the Gulf of California the set is generally to the northward, and on the coast of Mexico from Manzanilla to Cape Corientes the current is always to the N. W. along the coast, and sometimes with great velocity. This current will set you in towards the coast and must be looked out for when bound to the S. E.

Along the coast from Manzanilla to Point Sacrificios the current is supposed to set to the S. E. and *east* during the winter months; and to the N. W. and west in summer, when S. E. winds prevail. This is not, however, by any means always the case

In the Gulf of Tehuantepec on a line between Acapulco and Montuosa Islands you will almost always find the current setting to the W. N. W., but if you run over to the coast of Guatemala the current will probably be to the S. E. and *east* as you approach the coast.

Along the coast of Guatemala and Salvador the current cannot be depended on: sometimes west, at others east. Imray says that at Acajutla the current is always E. S. E., but this is a mistake

The most decided current is off Point Gilones. This runs with great velocity to the N. W., and at all seasons, though I think it is stronger in the winter months. If you run either direct to Acapulco or to San Jose de Guatemala you will find this current. It sets N. N. W. towards Realejo, (Corinto) N. W. towards San Jose, and as you get to the westward W. N. W. and west, until

you get near the land. If you are running direct to Acapulco you will carry it well over to the Mexican coast.

In making the ports of Acajutla or San Jose from Point Gilones it is necessary to haul well up to the eastward, otherwise you will make the land to the westward of your port.

From Cape Blanco to Point Puercos you cannot depend on the current, as you are within the influence of the tides.

In the Gulf of Panama I believe the current always sets to the southward on the west coast. The flood tide runs up on the eastern shore. I do not remember ever to have experienced a northerly set from Cape Mala to Panama.

*Tides.*—You are frequently within the influence of the tides along these coasts. The ebb tide out of San Francisco extends, I believe, down the coast as far as Point San Pedro. In passing the entrance to Magdalena Bay, you are also influenced by them, and probably all along the coast of Guatemala and Salvador.

It is between Cape Blanco and Panama, however, that you are most under their influence. The flood sets *up* into the Gulfs of Nicoya and Dulce and into the bight on both sides of Coiba Island, whereas the ebb will set you *out*. Do not neglect, then, to calculate the time of high water along this coast if the weather is thick, or the nights dark and rainy.

*Winds and Weather.*—I have but little to say on this subject, as Imray contains full information. The remarks of Commander Wood, R. N., are very good. Speaking generally, I will say that for eight months in the year you will find N. W. winds and a large sea from Cape St. Lucas to San Francisco. In November, December, January and February S. E. and S. W. winds prevail.

Along the coast of Mexico northerly winds prevail in winter (dry season) and S. E. and S. W. in summer. You have also the regular land and sea breezes when close in shore; northerly at night and S. W. in the afternoon.

In the Gulf of Tehuantepec north winds prevail (and sometimes with great violence) from November to April. In summer S. E. and southerly winds.

Off the Gulfs of Fonseca and Nicaragua in winter you will experience strong N. E. winds and a very ugly short sea; in summer S. W. winds. From Cape Blanco to Point Puercos S. W. winds prevail most of the year in the daytime, with land winds at night.

In the Gulf of Panama strong north winds in the dry season—southerly winds the remainder of the year.

*Water Spouts* are frequent along these coasts in the rainy season, and I would advise you to steer clear of them. Observe the direction in which they are traveling and run away from them.

In going up the Gulf of Tehuantepec against a strong "norther" and heavy head sea, be sure and slow your ship down to avoid straining her unnecessarily. This applies to all similar cases. The moment your ship commences taking in water over the bows, whether in running against a head sea, or in crossing a bar, it is time to ease her by slowing down a turn or two.

*The Compass*.—You cannot bestow too much care upon this important instrument. As soon as you leave port you should take bearings of known objects; observe azimuths and amplitudes and compare the variations with that on the chart, and observe how your compass carries you in running from point to point.

The only check upon your compass is *constant observation*. No magnets, deviation tables or anything else takes its place. I cannot conceive how a navigator can fail to discover any great error of the compass! I have made it a rule to observe not only the amplitude of the sun, but of the stars. When running nearly east or west—for instance, when a known planet or star is rising or setting, put the ship's head on it, calculate the amplitude and compare the result. This is only five minute's work.

The aftermost compass is apt to be neglected; yet, if your forward wheel and compass are carried away, you will want to steer by it. Every day at noon, the first officer should enter on the ship's log-book the heading of the ship by—

The standard compass;

The binnacle compass;

And the aftermost compass.

The Quarter-master leaving the wheel should report the course he has just passed. In fact, as officer of the deck, you have three principal duties to attend to :

1. *Steer your course*;
2. *Keep a good lookout*;
3. *Keep the ship upright*.

Should you leave port in a fog, and with no information as to your compasses, be sure and run well off the land, and do not approach it again until the fog lifts.

The compass is sometimes affected by the kind of cargo you have—boilers or machinery on the main deck for example. *Constant observation and watchfulness* will alone ensure the safety of your ship. Let me impress this upon you.

The variation compass on Imray's chart of Central America is in error. It is drawn for a variation of nearly one point, whereas the variation is but about three-quarters of a point. In laying off your course by compass, observe this.

*The Lead*—The lead-lines should be frequently examined, and the marks corrected. All along the coasts of Guatemala and Salvador and off San Francisco bar you will often want to use it.

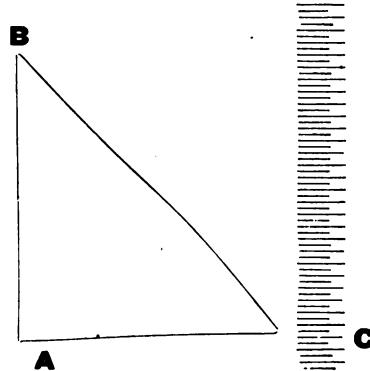
At night it is almost impossible to see the marks in a ship high out of the water. I would suggest your marking *one* hand-lead-line in this manner.

Put your leadsmen in his place; take the distance from his hand to the water, (at mean draft,) lay this distance off from the lead, and commence marking the line from this point. The advantage of this is that the leadsmen will then *hold the mark indicating the depth of water in his hand*.

Put a large *tally* on this line marked: "Night Lead-Line," so that the leadsmen cannot possibly get another by mistake.

I have used a line marked in this manner with good results.

*Distance from Shore*.—I have frequently been struck with the great difference in the estimate of the distance from the shore by different persons. One officer will put the distance at one mile; and, perhaps, the one next on watch will put it at three or four. To obviate this I have accustomed my watch officers to get the distance by observation, thus:



The ship sailing along the shore, from A to B, take the time when any well-defined object, as C, is abeam, and again when it is four points abaft the beam, as at B. The angle A being eight points and B and C each four, the distance from shore A C is equal to the distance A B run by the ship in the interval.

For example: if you are running ten knots an hour, and the ship is twelve minutes in running from A to B, the distance from shore is equal to two miles.

You will find this a close approximation, and the officer of the deck readily picks it up; and it accustoms him, also, to the use of the alidade.

Or you may take an object four points forward of the beam and then note the time elapsed until it is abeam, and the distance from shore will equal the distance run in the interval.

Of course the ship's course must not be changed.

It is always better to mark the position of your ship by taking the time when a known object is abeam and estimating or calculating the distance. In such a case you need not bother yourself about cross-bearings. Distant objects—mountains and volcanoes—are often obscured, and even when visible, as their correct positions are not marked on the chart, you do not obtain good results.

In running along the land at night you will know when you are too close in by hearing the breakers, feeling the ground swell, or by smelling the land—particularly where the mangrove grows. In the dry season you will smell the smoke from the burning brush. Always haul out at these indications.

Breakers can be seen ten miles from the deck in the daytime; and six or seven on a clear moonlight night if there is much sea on, or if the water is very phosphorescent.

In the dry season, when the brush is burning, it is so smoky and hazy over the land that you cannot see it more than six or seven miles off, and you will sometimes see the breakers before you make the land.

Always take sketch of remarkable headlands, islands, &c., and put in your note-book. It assists you wonderfully in recognizing them afterwards at night.

In running to pick up a mark for your port, should it set in very thick about the time you are expecting to make it, it is better to refuse it [*i. e.*, haul out], and run for the next point, in the hope of more favorable weather.

For example, suppose you run direct for Montuosa Island from

Acapulco. If it should set in thick about the time you are expecting to see it, haul out, give it a good berth, and run for Hicarita. If the same thing should occur, haul out again and run for Point Mariato.

You will surely get hold of one of the three, and the last departure is always the best. By adopting this plan you avoid an unnecessary risk and save yourself some anxiety.

In taking observations, use a watch and mark your own time. Compare your watch with the chronometer, take your observations, and then compare the watch again to see whether it has gained or lost in the interval. This is much more accurate than measuring the altitude and then walking to look at your chronometer, particularly when you have to walk the length of the deck.

You can frequently get the latitude by the meridian altitude of the moon at about the time of taking your A. M. or P. M. observations.

*Fogs.*—On the coast of California fogs prevail all the spring, summer and fall; being very dense in the fall. I have observed that in the fall the fog lies close to the sea, and you can sometimes see the lights at Point Bonita over it. In summer, the fog rises and settles over the tops of the mountains and hills, obscuring the lights; but then you can often make out the shore and breakers and get into port without difficulty.

Nothing is more deceiving than a thick fog. You very often fancy you can see half a mile or so, when you cannot really see a ship's length. This is especially the case in a moonlight night. You see the horizon, apparently, in all directions; but this is the effect of the light.

As soon as you are enveloped in a fog, place your lookouts in the bows, direct the engineer to be ready to answer the bell, and have the officer of the watch forward of the pilot house with the line to the steam whistle convenient. Blow short whistles every two minutes and listen for a reply.

Station an officer at the bells and lower all the pilot-house windows. Direct the lookouts to *point* to the object seen as they report it. As soon as anything is reported, *stop the ship*; then, if it is ahead or nearly so, *ring to back*; otherwise, wait until you see the object yourself, and, when *sure* that you are clear, go ahead.

Avoid steering too many courses: supposing you to know your

exact position steer for the next point, giving it a proper berth, and do not be tempted to haul in for the land until the fog lifts.

Keep the run of your ship with the utmost exactness. Throw the patent log over and examine it every few hours. You should test your patent log in fair weather by comparing it with known distances run, and by this means ascertain its error. Unless you have done so it will be of no use to you; on the contrary, it may mislead you. I have never known it to give a good result when running over ten knots an hour, and must confess to having but little confidence in it at any time. I much prefer to estimate the distance by the revolutions of the wheels. By noting daily the number, to divide the whole number of revolutions by, in order to get the distance run by observation, you can estimate it with much accuracy.

You may run for San Francisco Bar with the lead. In a fog you cannot use this too often. Where there are no soundings you should *never* attempt to make the land in a fog. Fog trumpets are used by vessels on the Eastern coast of the United States, but I have never heard one on this coast.

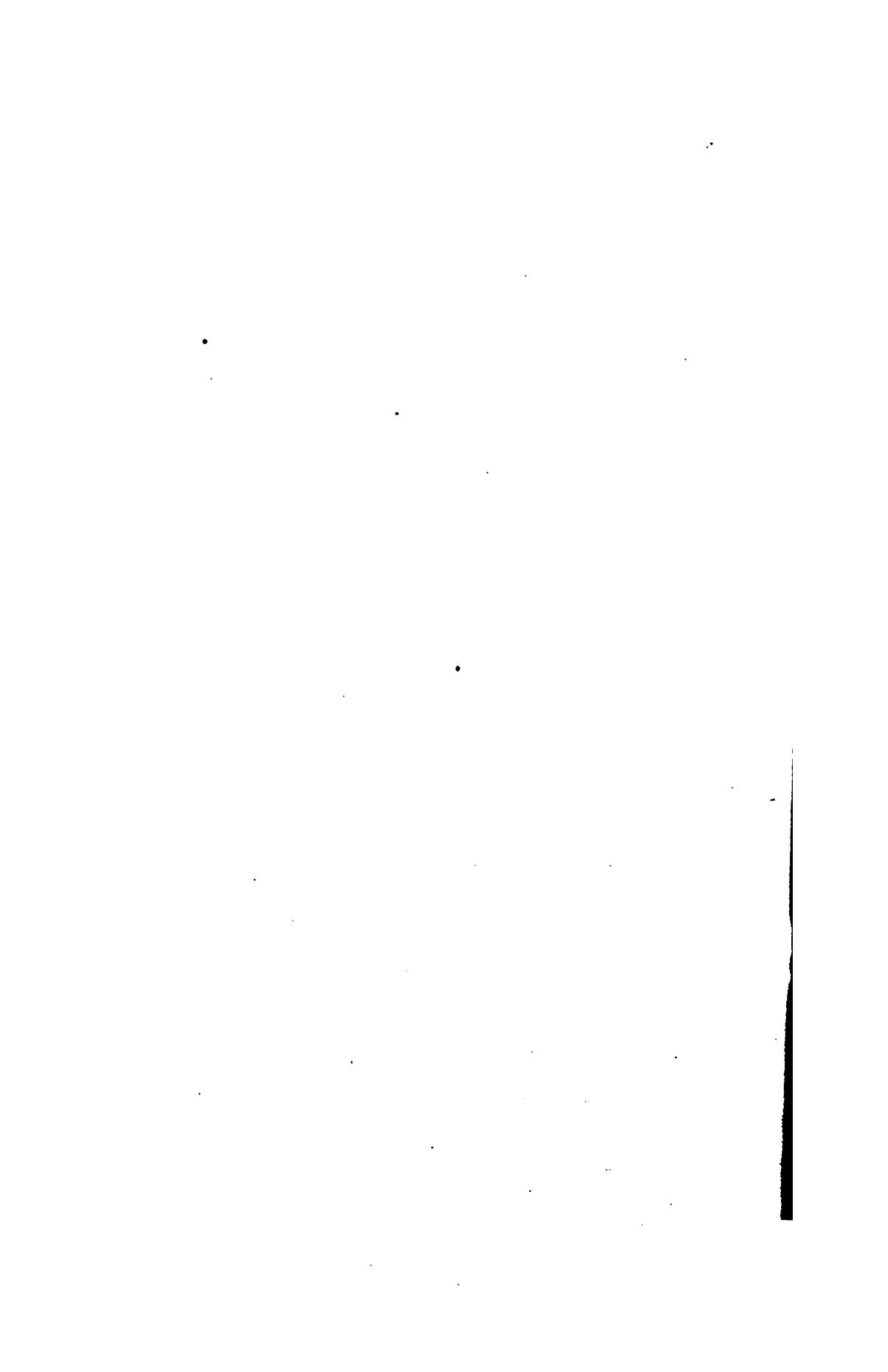
Should you arrive off the Bar—say in twenty fathoms of water—and still not see anything, you must await clear weather.

I cannot understand the philosophy of “running in a circle” in a fog. It appears to me you run the risk of collision and lose your reckoning.

I would recommend stopping the engine and letting the ship lie quiet. Throw the deep-sea lead over the bows to ascertain the direction of drift and whether you shoal the water. If expecting to be out all night, anchor with a kedge and hawser.

## 4. TABLE OF POSITIONS.

Name.	Lat. N.	Long. W.	Remarks.
San Benito's Is....	28° 18'	115° 38'	N. W. Island.
San Pablo.....	27° 14'	114° 25'	Dark slate-colored bluff.
Sandy Bluff.....	27° 12'	114° 21'	
S. Roque Is.....	27° 09'	114° 19'	Low rocky island.
Asuncion Is.....	27° 07'	114° 13'	Sandy island, moderate height.
C. San Lazaro.....	24° 46'	112° 20'	Middle of point.
Morro Petatian.....	17° 31'	101° 27'	Seven white rocks to N. W.
Pt. Tequepa.....	17° 17'	101° 01'	Bold point.
Corcovado Peak.....	16° 57'	99° 29'	Humpbacked peak.
Tartar Shoal.....	16° 11'	98° 32'	Off white cliffs.
Rio Verde.....	15° 59'	97° 48'	
Little Morro.....	15° 59'	97° 40'	Moderately high.
Morro Hermoso.....	15° 58'	97° 32'	High and two miles wide.
Alcatrazes.....	15° 55'	97° 21'	Two white rocks.
Bluff.....	15° 50'	97° 03'	Huts and trees on top.
White Rock.....	15° 40'	96° 30'	One and a half miles west of Port Angeles.
Pt. Sacrificios.....	15° 43'	96° 12'	Rocks lying half a mile off.
Pt. Guatulco.....	15° 45'	96° 04'	Known by spouting rock.
Estrete Is.....	15° 58'	95° 29'	Large white rock.
Sand Down.....	15° 59'	95° 20'	
Pt. Ventosa.....	16° 10'	95° 08'	Monument or tower on point.
Church.....	16° 15'	94° 56'	White cupola.
Do.....	16° 14'	94° 47'	Do.
San Francisco Bar.....	16° 13'	94° 40'	Village near it on the beach.
Morro.....	16° 13'	94° 37'	Marked with strips of white sand.
Soconusco Bluff.....	15° 54'	93° 39'	Double-headed volcano back of it.
Huts.....	15° 12'	92° 55'	Detached.
San Benito.....	14° 48'	92° 30'	
Champerico.....	14° 20'	91° 57'	White flagstaff.
St. Louis.....	14° 13'	91° 47'	
Cecegapa.....	14° 06'	91° 38'	Large house two miles to eastward.
San Jeronimo.....	13° 52'	91° 16'	do six " " "
San Jose.....	13° 53'	90° 49'	Custom house and wharf.
Istapa.....	13° 54'	90° 33'	Tower overgrown with foliage.
Acajutla.....	13° 35'	89° 49'	Custom house.
Libertad.....	13° 30'	89° 16'	Imray's position.
Lempa Shoal.....	13° 07'	88° 15'	Longitude estimated.
Point Gilones.....	9° 56'	85° 38'	Morro Hermoso of Belcher.
Cape Blanco.....	9° 34'	85° 04'	White rock off the Cape.
Cano Island.....	8° 40'	83° 51'	Reef extending a mile to westward



## APPENDIX



## R E M A R K S.

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This Appendix contains the results of eighteen months further observations on the Coasts between San Francisco and Panama.

As some previous remarks are modified, and many positions corrected, the reader is particularly requested to read it in connection with the foregoing remarks.

The *Table of Positions* at the end is to be used instead of the one on page 47.

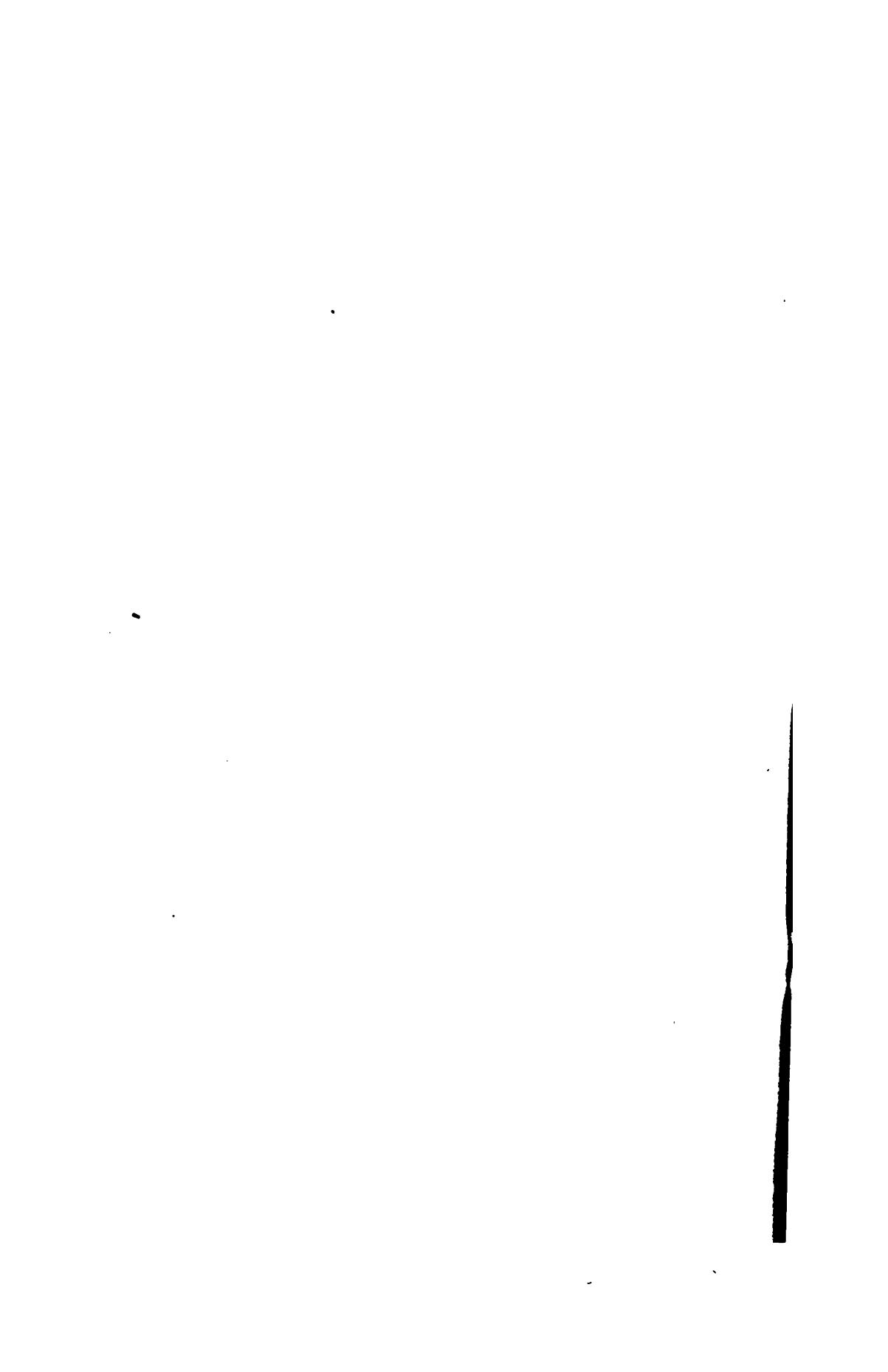
Several *Tables of Distances* have been added.

*All Bearings and Courses are Magnetic.*

*All Longitudes reckoned from Greenwich.*

SAN FRANCISCO,

March, 1873.



## A P P E N D I X.

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### SAN FRANCISCO BAR.

I am inclined to think that there is less water on the Bar to the southward of Point Lobos, than there was when last surveyed, as I have frequently seen it break there when there were no indications of breakers to the westward or northward.

I have been told by a former pilot of San Francisco that *South by West* from Point Bonita, and about the middle of the Bar, there is a spot with but  $3\frac{1}{2}$  fathoms water on it at low water.

Buoys have been placed in the main ship channel to the outer edge of the Bar, with Fort Point and Alcatraz in line, since the first edition of these Remarks.

### FROM SAN FRANCISCO TO SAN PEDRO.

Leaving San Francisco *in a fog*, bound to San Pedro, if you cannot get hold of Point Conception, it is better to go outside of San Miguel Island, and, after being assured that you are south of it, haul up for Point Fermin and you have a clear run of 120 miles.

You will know when you are under the lee of San Miguel and Santa Rosa Islands by the smoothness of the water.

Should you make the northwest end of Catalina Island you will recognise it by a large rock off it resembling a sloop under sail.

There is a rock *under water* off Point Fermin or Point Pedro, variously estimated at from one third to two thirds of a mile off shore; but if you bring Deadman's Island to bear N. by W.  $\frac{1}{4}$  W. and run for it, you will certainly clear it.

If near San Pedro anchorage in a fog, should you determine to attempt to find your way in, it is better to be *sure* that you are south of Point Fermin, and then feel your way with the lead between Anaheim and the anchorage. On the eastern side of the Bay you will find shoal water and kelp. Having once got hold of the latter, follow round to the anchorage.

It would not be prudent to push in between Point Vincent and Point Fermin *even with the lead*, in a thick fog, unless there should

be swell enough to enable you to hear the breakers in good season.

In strong S. E. or S. W. gales shelter can be found under the N. W. end of Santa Catalina Island.

There is a Telegraph from San Pedro to San Francisco ; also from Santa Barbara.

The following bearings I took from the Company's Buoy at this Roadstead:

Deadman's Island..... N.  $\frac{1}{4}$  E.  
 Point Pedro..... S. W. by S.  $\frac{1}{2}$  S.  
 Extreme eastern point of low land..... E.  $\frac{1}{2}$  N.  
 N. W. end of Catalina Island *shut in* by Point Pedro.

In 4 $\frac{3}{4}$  fathoms High Water.

The following I took from an anchorage near our Buoy:

Deadman's Island..... N.  $\frac{1}{4}$  W.  
 Point Pedro..... S. W. by S.  $\frac{3}{4}$  S.  
 Flag staff at San Pedro wharf..... N. W.  $\frac{7}{8}$  N.  
 N. W. end of Santa Catalina Island shut in by Pt. Pedro.

In 4 fathoms Quarter Tide.

#### ANAHEIM LANDING.

*Anaheim* bears about E. by N.  $\frac{3}{4}$  N. from San Pedro anchorage, and it is about nine miles from anchorage to anchorage.

The landing is in

Lat. ....  $33^{\circ} 43'$ .

Long. ....  $118^{\circ} 04'$ .

Anchor in 4 fathoms (low water) half a mile off shore, and near the launches.

The Company's Light bearing N. by E.  $\frac{1}{2}$  E.

In approaching Anaheim from the southward steer directly for it. When the last of the high land is abeam you are about 13 miles off. You will then see a moderately low point on your starboard bow, and a very low point a very little on your starboard bow ; when the former is abeam you are *seven miles off*, and the Landing is a mile or two beyond the latter.

#### SANTA BARBARA.

The Company's Buoy here is in 6 fathoms water. Stearn's wharf Red Light *North*. Other Red Light on wharf N. W.  $\frac{3}{4}$  W.

*With the Light shut in.*

## FROM SAN FRANCISCO TO SAN DIEGO.

From San Francisco to San Diego *in a Fog*, it is better to go outside of San Miguel Island, unless you can get hold of Point Conception, and outside of *all* the Islands unless you can get a departure from the west end of San Miguel Island or Richardson's Rocks.

Should you run into the Santa Barbara Channel without having seen Point Conception, you would not dare to run between Anacapa and the Main, and consequently would be obliged to stop until the fog lifted, and drift with the current.

Also, should you pass San Miguel without seeing it, it would not be prudent to pass inside of San Nicolas and San Clemente for fear of Beggs' Rock.

In running to pick up the land about San Diego, the same remarks will apply as to San Pedro. The soundings are shoaler and more regular *to the southward*, and you also have the Kelp to indicate your position.

South of Point Loma there is a sand beach, from San Diego to the boundary line. The land back of it is broken into irregular-shaped high hills. In latitude  $32^{\circ} 20'$ , and near the coast, is a remarkable *Table Hill*, very flat and regular on top and an excellent landmark.

North of Point Loma for about 4 miles there are low steep cliffs and no beach; thence into False Bay very much like San Diego. There is a Sand Down about 11 miles North of Point Loma.

The hills are higher and farther back from the coast than to the southward of the Point, with high mountains (sometimes covered with snow) in the interior, and some showing back of Point Loma.

False Cape may in the lighting up of a fog be mistaken for Point Loma, but if you bring it to bear about N. by W.  $\frac{1}{4}$  W. you will at once see by the *nearness* and appearance of the land abeam [bearing E. by N.  $\frac{1}{4}$  N.] which it is.

The surf can be heard on Point Loma when it cannot be heard on other points in the vicinity.

I am told that the whale boats from San Diego are to be fallen in with towards False Bay, in the winter months, and to the southward of Point Loma during the summer.

I have sounded 2 miles off shore between Point Loma and False Cape in 65 fathoms, fine sand.

In running for San Pedro or San Diego, between or outside of the Islands, I have generally experienced an easterly set. In a fog, therefore, it is necessary to *stop in time*.

The Light on Point Loma is often obscured by the fog when the shore line is visible.

#### THE CORONADOS.

I have frequently passed inside the Coronados, closer to the Islands than to the Main, and seen no indications of reefs or shoal water.

Kelp has been reported here ; but Mr. Niles, pilot of San Diego, tells me he has never seen or heard of any dangers.

I have seen Kelp extending one mile south from the Islands.

#### POINT HUENEME.

There is a wharf here in latitude  $34^{\circ} 08'$ , longitude  $119^{\circ} 09'$ , bearing N. E. by N. from the east end of Anacapa Island.

The land hereabouts is low and the soundings probably regular. The first high bluff to the S. E. is about 5 miles distant.

To the N. W. the high land begins again somewhere about San Buenaventura.

#### Buoys.

Buoys will probably soon be placed at Santa Barbara, San Pedro and Anaheim, by the Pacific Mail S. S. Company for mooring purposes.

#### CURRENTS.

I have generally found the current setting to the westward in the Santa Barbara channel.

I make Point Gorda Rock 14 miles from Piedras Blancas, and Point Gorda itself 13 miles.

#### FOG HORN AT POINT BONITA.

A *Steam Fog Horn* will be sounded in foggy weather. The characteristic distinction of this fog signal is, that *blasts of four* seconds duration will be made, separated by intervals of thirty-five seconds.

#### LIGHT AT PIGEON POINT

This Light is 1st Order Fresnel, 150 feet above the sea. Shows white flashes every 10 seconds, with eclipses between.

Can be seen from the deck of a vessel 15 feet above the sea  $18\frac{1}{2}$  nautical miles.

*A Steam Fog Whistle at Pigeon Point* is sounded in foggy weather, at intervals alternately of 7 and 45 seconds, the blasts being 4 seconds.

*A Steam Fog Whistle* has been established on Año Nuevo Island. Blasts of 15 seconds at intervals of 45 seconds.

#### FOG WHISTLE AT POINT CONCEPTION.

*A Steam Fog Whistle* has been established here.

During foggy weather the signal will be sounded at intervals of 52 seconds, the length of each blasts being 8 seconds.

A Light will be put on Point Fermin soon, and a Fog Whistle at Hueneme.

#### COAST LINE BETWEEN SAN DIEGO AND POINT EUGENIO.

I have never been nearer this coast than 10 miles.

Imray's Charts, published in 1849 and 1869, give the following positions respectively :

Cape Todos Santos .....	1849	Lat. $32^{\circ} 00'$	Long. $116^{\circ} 49'$
Do. ....	1869	" $31^{\circ} 42'$	" $116^{\circ} 45'$
Cape Colnet .....	1849	Lat. $31^{\circ} 06'$	Long. $116^{\circ} 40'$
Do. ....	1869	" $30^{\circ} 59'$	" $116^{\circ} 16'$
San Martin Island .....	1849	Lat. $30^{\circ} 46'$	Long. $116^{\circ} 25'$
Do. ....	1869	" $30^{\circ} 30'$	" $116^{\circ} 03'$
San Gerónimo Is'd .....	1849	Lat. $30^{\circ} 15'$	Long. $116^{\circ} 25'$
Do. ....	1869	" $29^{\circ} 41'$	" $115^{\circ} 43'$
Canoas Bay .....	1849	Lat. $29^{\circ} 21'$	Long. $115^{\circ} 27'$
Do. ....	1869	" $29^{\circ} 10'$	" $115^{\circ} 00'$
Point Eugenio .....	1849	Lat. $27^{\circ} 53'$	Long. $115^{\circ} 09'$
Do. ....	1869	" $27^{\circ} 53'$	" $115^{\circ} 07'$

It will be seen that the Chart of 1849 places the coast from 20 to 30 miles *too far to the westward*; and it seems that the Chart of 1869, in correcting this error, has placed some of the Points *too far to the eastward*.

*San Gerónimo Island*, according to Captain Nolan, of the Pacific Mail Steamship Company, lies in latitude  $29^{\circ} 48'$ , long.  $115^{\circ} 51'$ .

There is a dangerous Reef about 7 miles to the *southward and eastward* of the Island. This reef extends some ten or twelve miles off Point San Antonio, in a direction about *west by north*.

The following is from the *ALTA CALIFORNIA*, of San Francisco :

“ Soundings were made by Capt. Nolan to ascertain whether there was a good harbor on the southeast side of the Island (San Gerónimo). He had passed in coming to the southwest of the Island within three miles of the shore, and then steering straight to his anchorage one mile from centre of Island to southeast. There he found thirteen fathoms, with good holding ground in hard sandy bottom. Sounding in towards the Island he found that it shoaled gradually to about ten fathoms, half a mile from shore. To westward half a mile, soundings showed a depth of eleven fathoms; at one mile, nine fathoms; then further, seventeen; and at the end of the reef, running out about half a mile from southwest end of the Island, eleven fathoms. Sounding across south of the last position to Sacramento Reef, he found in the middle of the passage, one mile and a half from the Island, seventeen fathoms, shoaling gradually toward Sacramento Reef to thirteen fathoms at the edge. Following round eastward he found eleven fathoms along the edge of the reef, and inside thirteen fathoms.

“ These facts show that under the southeast side of the Island there is a good harbor, (anchorage?) which vessels may take advantage of during a northwest blow. The directions would be to hold in towards the Island until it bears northeast about two miles and a half, and then proceed straight to anchorage within one mile of the centre to the southeast.

“ *San Gerónimo Island* is about one mile and a half long, by a third of a mile wide, lying northeast and southwest. It is low on the southwest, projecting out into a rocky reef. Toward the centre and northwest point it rises into a succession of hills and promontories, the highest being about two hundred and fifty feet in altitude. Off the northeast point, and off the reef (to) the southwest, kelp is discernible, indicating shoals. The Island is almost entirely barren.”

As Cape Colnet and San Quentin were surveyed by Captain Belcher, R. N., it is probable that their positions on Imray’s Chart are correct or nearly so.

San Martin I consider, from my own observations, to be nearly correctly laid down.

By Imray’s Chart of 1869 if you shape a course to clear the land ten miles, along this coast, you will be on the safe side. It has never struck me in running from Cerros Island to San Diego, that the coast line was very much out.

It is understood that all this coast is soon to be surveyed by the United States Government.

I have passed between Natividad Island and Point Eugenio, side of Cerros Island, to avoid the N. W. wind and sea outside. The Rock, *under water*, is about one third of the distance acre from Natividad Island. It breaks on it in a heavy sea.

By keeping one mile from the Point you will be all clear. It seems to be nothing in the way along the East side of the Island.

The North End of Cerros Island is in latitude  $28^{\circ} 23'$ , longitude  $115^{\circ} 14'$ .

There is a good passage between the San Benitos Islands and Cerros Island. I have passed along the East coast of the Eastermost Benito, distant two miles.

The Westermost Benito is 19 miles from Cape St. Augustine. Cape St. Augustine is 14 miles from Natividad Island. So that it is 33 miles from the Benito to Natividad, and not 28, as given in the Table of Distances.

There is doubtless a good passage inside of Asuncion Island, *and after it has been surveyed*, it will be well to use it on the up-trip in strong N. W. winds and sea. The water there is smooth in the strongest winds.

In passing Point Abreojos, bound up, I would remark that if you are near enough to the Main to see the breakers—say 9 miles—you will make Asuncion Island ahead, or on the port bow. Between the Point and the Island there are several remarkable *Domes*, which lie far away back of the coast-line, and are constantly changing their relative positions with the Point and adjacent land. The centre one of these Domes lies in lat.  $27^{\circ} 13'$ , long.  $113^{\circ} 28'$ .

On page 7 of the previous Remarks, I have stated that a Compass which will carry you S. E.  $\frac{1}{2}$  E., instead of S. E., will also carry you N. W.  $\frac{1}{2}$  W. instead of N. W., but this is not always the case. In the last steamer I commanded, the Compass carried S. E.  $\frac{1}{2}$  S. instead of S. E., and N. W.  $\frac{1}{2}$  W. instead of N. W.

#### MAGDALENA BAY.

As I before remarked, there is no difficulty in entering this Bay. Should you wish to anchor in Man-of-war Cove [the Observatory of Belcher's Chart] *at night*, the following notes from my Remark Book may be of service :

“Having rounded Point Entrada, half a mile distant, haul up along the land to the westward. From Point Entrada to Mount Isabel the land is only tolerably high. Mount Isabel is the first high land after entering, and when that is abeam the shoal or sand spit running off from the low point, (the only danger,) 3 miles inside of Point Entrada, is *abaft the beam*, and you can haul up with safety for Cove Point. Thence the land is high to Cove Point, gradually sloping towards the Point.

“The land *recedes* a little from Point Entrada to the sand spit.

" You cannot fail to make Cove Point distinct from the land back of it. Run close to it, and follow to the anchorage, which is directly off the houses. Anchor in 8 or 9 fathoms water,  $\frac{1}{2}$  mile from the beach.

" The land back of the houses is high, with low land to the right."

The following is an extract from a letter of Captain Thomas S. Phelps, commanding U. S. S. Saranac, dated Magdalena Bay, February 6th, 1872 :

" While approaching the entrance of this Bay from the southward, with a heavy swell from the northward and westward, I observed an occasional heavy breaker three-fourths of a mile from the extreme point of Cape Redondo (the western extremity of Santa Margarita Island), with an ugly swell extending about a fourth of a mile beyond. There was a second breaker about half way between the outer one and the Point.

" From my observations I feel warranted in saying that no deep vessel should go within one and a half miles of Cape Redondo, while entering or leaving Magdalena Bay."

I have several times seen the breaker to which Capt. Phelps alludes. It is doubtless on the sunken rock previously reported to exist hereabouts. I consider three-fourths of a mile ample berth to give Cape Redondo, but it is always safe to borrow towards Point Entrada.

*Salatea Village* is in *San José del Cabo Bay*, and is about 14 miles from Cape St. Lucas.

#### MAZATLAN.

*Blossom Rock* is buoyed. The chain being too short, the buoy disappears at high water.

The buoy is not exactly over the rock, but a little outside of it.

Navigators should not trust to a buoy here, as it is frequently removed or drifted out of position.

I am informed by Lieutenant Craigie, R. N., that Capt. Kennedy, commanding H. B. M. S. Reindeer, found the top of this rock *but three feet below the surface at low water*. It is a pinnacle, and best be found by sweeping.

#### ISABEL ISLAND.

This island appears as described in Imray's S. D., and is directly laid down. I have seen it 23 miles.

## CORVETENA.

The last time I made the Corvetena was from the northward. At 8 miles distant, bearing S. by E.  $\frac{1}{2}$  E., it appeared as a small, dark-colored rock—then two smaller rocks made to the left, and as we got nearer it made *in one small islet*. I passed one mile outside of it.

I have seen it 11 miles of a clear day.

## SIHUATANEJO.

This Harbor is correctly placed by Capt. Kellett, R. N.

I have been close in to the entrance in the Alaska and Idaho, and find the following remarks in my Note Book :

Approaching this Harbor from the westward, and steering to pass say four miles outside of Isla Grande, [about E. by N.  $\frac{1}{4}$  N.,] when 6 or 7 miles from the entrance you will see a bold, dark-colored bluff, with high land back of it, and other bold bluffs to the left of it. As you get nearer you will make the *Black Rock* [which lies S.  $\frac{1}{2}$  W. one and a half miles from the middle of the entrance] to the right of the bold, dark bluff.

After passing Isla Grande [a tolerably long, dark-colored island, not very high] at about a distance of 4 miles, and the Islas Blancas [several irregular-shaped White Rocks] at about a distance of three miles, a whitish bluff is seen to the left of the dark one—but not so high.

The Harbor is between the Bluffs—the dark, high one forming the right hand one.

*From Isla Grande to Black Rock is  $4\frac{1}{2}$  miles.*

*From Islas Blancas to Black Rock is 3 miles.*

As you get near Black Rock you will see several huts at the bottom of the harbor, with cleared ground near by, and on a bluff on the left hand side are white spots like clothes drying.

On the right of the harbor there is a long beach extending some miles. To the westward, between Islas Blancas and the entrance, several bluffs and strips of sand beach.

From Black Rock Point Tequepa (or the land making towards it) is seen between Morro Petatlan and the White Friars, bearing about S. E. by E.

Approaching Sihuatanejo from the eastward and steering so as

to pass the \*Seven White Friars a mile off, haul up about N. W.  $\frac{1}{2}$  W., with Isla Grande ahead, and the Black Rock will be *on* with a bluff which is to the westward of the entrance, and will soon heave in sight.

In approaching either from the East or West the most *prominent* bluff will be on the *farther side* of the entrance.

Approaching this harbor from the southward, when about twelve miles off, you will see the White Friars on your starboard bow and the Islas Blancas on the port bow, and as you draw nearer the Black Rock ahead.

The Black Rock is *the* mark for this harbor, and without getting hold of it it would be very difficult to enter at night—without a light. There is no difficulty by day.

*From Black Rock to North White Friar is 6 miles; Course about S. E.  $\frac{1}{2}$  S.*

*From Black Rock to Morro Petatlan is 9 miles*

A little to the westward of this harbor, back of Isla Grande, is a very high mountain—the first after passing Mangrove Point. This is the “high and very remarkable mountain, over the East side of Salt Pit Bay,” mentioned by Imray.

The above Directions are only for finding the harbor; after getting up with the Black Rock you have Capt. Kellett’s Chart to guide you.

Sihuatanjo *may* become a place of importance as the terminus of a rail road. At present vessels go here (after entering at Acapulco), during the dry season, to load dye-wood.

The coast between Isla Grande and Mangrove Bluff is unknown, and I think the water shoaler than off other parts of the coast.

*Point Tequepa* bears S. E. by E.  $\frac{3}{4}$  E. from Morro Petatlan; distant about 30 miles. A mile or two to the westward of the Point there is a single, large, white rock, mentioned by Lord Anson.

*Point Apusabacos* is about 25 miles from Point Tequepa, and 45 from Griffon Island. There is a small village here, and a sharp *Ridge* coming down to the shore.

#### ACAPULCO.

The Light on Griffon Island has been discontinued.

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\* NOTE.—The Seven White Friars are the white rocks lying off Morro Petatlan. So called by Commodore Anson, R. N.

In making the Port from the westward, at night, remember that the Potrero *makes as an Island*, in consequence of the low neck of land connecting it with the Main. This is often taken for Griffon Island ; but the latter never makes *clear* of the main land.

*Apusabalcos Bluff* bears W. by N.  $\frac{3}{4}$  N. from Griffon Island. *Point Tequepa* bears W. by N.  $\frac{1}{4}$  N. from Griffon Island.

#### TARTAR SHOAL.

Captain Johnson, U. S. N., commanding the Surveying vessel Hassler, gives the latitude of the least water he found on this shoal [*three and a quarter fathoms*] as  $16^{\circ} 16' 21''$ . Longitude (approximate)  $98^{\circ} 36' 30''$ . He places this spot  $2\frac{1}{6}$  miles off shore, and says that 4 miles off clears everything in 9 fathoms water.

He reports a passage inside the shoal.

The Huts on the Bluff in latitude  $15^{\circ} 50'$ , longitude  $97^{\circ} 03'$ , mentioned on page 10 (previous Remarks) are near Port Escondido. This is a good anchorage for small vessels, and an excellent landing place for boats ; as is also the bight to the right and inside of the Little Morro mentioned on same page.

Between the Morro Hermoso and the Alcatrazes is a village, and probably good landing places can be found inside and under the lee of the White Rocks near by.

#### PORTE ANGELES.

The Central American and Mexican steamers of the Pacific Mail S. S. Company now touch here. They anchor near the entrance of the port, which is very small.

As it is sometimes difficult to find, I will say, that in coming from the eastward, you will be sure to see the large house and adjacent huts put up by the Oil Company, about one mile East of the port, if you keep close enough in—say one mile and a half off. These buildings lie at the bottom of a cove with a sandy beach.

Port Angeles beach cannot be seen when you are abreast the oil works, but as you go to the westward you will see a strip of beach, gradually opening, and this is Port Angeles. It is a deep cove with a sand beach and bluff points on either side. One or two huts visible on the beach. The other buildings lie on the right hand side of the entrance and are not visible.

When approaching from the westward pass the White Rock close

to—half a mile off—and you will see a large, whitish-brown, rocky point, which forms the western side of the harbor. The *first* cove with a sand beach after passing the rock is Port Angeles—about  $1\frac{3}{4}$  or 2 miles distant.

*Port Guatulco* is about 24 miles from the White Rock. I have seen a barque at anchor here.

This was formerly the embarcadero for the city of Oajaca, but Port Angeles is now the port of entry.

This port was visited by Sir Francis Drake and Dampier. It is a better harbor than Port Angeles, but unhealthy.

#### SALINA CRUZ.

*Salina Cruz* is correctly laid down on Imray's Chart. It has been made a Port of Entry, and the Custom House removed from Port Ventosa, which is abandoned.

In anchoring here it is well to go close into the shore and veer a long scope, as in the winter or dry season the "Northerns" blow with great violence. There is no shelter here from southerly winds.

The "ruins of a large building, of a reddish color," mentioned on page 12 (previous Remarks), is a house partially completed.

*The Stone Tower on Ventosa Point* was built by the Mexican Government for a light house. It has never been used for that purpose, I believe.

#### TONALA BAR.

I have never had an opportunity of getting the longitude of Tonala Bar.

The Eastern Point of San Marcos Bay is in latitude  $16^{\circ} 06'$ ; longitude,  $93^{\circ} 48'$ .

The steamers do not anchor off Tonala Bar now, but off a place called, simply, *La Puerta*, between Tonala Bar and Soconusco Bluff. The land here is low with high land back of it.

I am told that the Port is 9 miles from Tonala Bar, and 12 miles from the town of Tonala, which is visible from the anchorage.

I have never been here.

#### THE EMBARCADEROS ON THE COAST OF GUATEMALA.

The *Embarcaderos* to the westward of San José de Guatemala are in succession :

1. San Gerónimo.
2. Tecojate.
3. Sesecapa.
4. San Luis.
5. Champerico.
6. San Benito.

This last is in Mexico, and near the boundary.

1. *The Embarcadero of San Gerónimo*, at the mouth of the Guacalate River, is 20 miles westward of San José, and is known by *one large house*. Six miles west of this house is the village of San Gerónimo, consisting of 12 or 15 small huts just back of the beach.

2. *Tecojate* is known by *four large houses*. It is about 34 miles westward of San José, in latitude  $13^{\circ} 54'$ , longitude  $91^{\circ} 22'$ . One and seven-tenths miles East of Tecojate you will see a hut and sheds for drying hides.

Anchor in  $5\frac{1}{2}$  fathoms water, one and a quarter miles off shore. Good holding ground.

*Santa María Volcano* bearing N. by W.  $\frac{1}{2}$  W. ; *Atitlan* N. by E.  $\frac{1}{8}$  E. ; *Agua Volcano* N. E.

This is the embarcadero of Mr. Wm. Nelson and Mr. Bramma. It is contemplated to build a wharf here.

3. *The Embarcadero of Sesecapa* is known by *one large house* with a flagstaff near by. Two or three miles westward of this house is the village of Sesecapa ; a collection of huts lying on both sides of a river.

The *embarcadero* is at the solitary house, which is 49 miles from San José.

Anchor in  $5\frac{1}{4}$  fathoms water, one and one-fourth miles off shore. Good holding ground.

*Santa María* bearing N.  $\frac{1}{2}$  W. ; *Atitlan*, N. E.  $\frac{1}{2}$  N. ; *Agua*, N. E.  $\frac{1}{2}$  E.

This is the embarcadero of Señor Guardiola.

4. *The Embarcadero of San Luis* is known by *one large house*, with huts on both sides. It is 64 miles from San José.

Anchor in 5 fathoms water, one and a quarter miles off shore. Good holding ground.

*Santa María* bearing N. by E. ; *Large House* N. by W.

Captain Bowditch says that W. N. W. of this anchorage, and off the mouth of a river, he found but three fathoms water.

This embarcadero is but little used, and in passing I would advise giving it a berth of at least two miles.

5. *Champerico*. This is the most important *embarcadero* after San José. It is known by *several large houses and two flagstaffs*. A collection of huts a little to the eastward. It is 77 miles from San José.

Anchor in  $5\frac{1}{4}$  fathoms water, three fourths of a mile off shore; good holding ground, sand and mud.

You will carry 5 fathoms water a long way in, and at times find *very heavy rollers*.

There are several Buoys near the shore, and not far from the anchorage, for hauling off the launches. They are, I believe, in 4 fathoms water.

The *Volcanoes* in succession from San José are :

1. *Agua*.
2. *Fuego* (double).
3. *Atitlan*.
4. *San Pedro*.
5. *Santa Maria* (double).
6. *Zunil*.
7. *San Benito*, or *Tajamulco*.

*Santa Maria* is the westernmost of the sharp-pointed volcanoes. It is high and a perfect cone.

*Atitlan* is also high and a perfect cone.

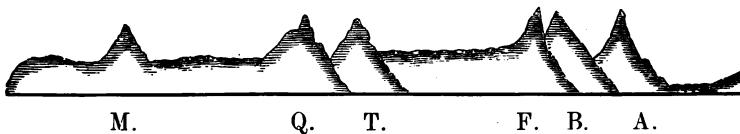
*Agua* is 12,313 feet high.

*Fuego* is 13,127 feet high.

NOTE.—*The Bearings given above for the anchorages off Tecojate, Seseca and San Luis are probably a little in error.*

In May, 1872, I anchored off *Champerico*, in the S. S. Alaska, in  $5\frac{1}{4}$  fathoms water. Distance from shore  $\frac{2}{3}$  of a mile. Observed the following bearings :

Atitlan Volcano.....	N. E. by E. $\frac{3}{4}$ E.
Fuego do.....	E. by N. $\frac{5}{8}$ N.
Agua do.....	E. by N. $\frac{1}{8}$ N.
Santa Maria vol.....	N. E. by N.
Right Flagstaff .....	N. E. $\frac{3}{4}$ N.

*Appearance of the Volcanoes from this anchorage.*

A. Agua ; B. Acatenango ; F. Fuego ; T. Atitlan ;  
Q. Quesaltenango ; M. Santa Maria.

The Tides rise and fall about 8 feet at full and change days.

At the full and change of the moon heavy rollers sometimes set in from the southward, without a breath of air, and break in 4 fathoms water. In such a case you would anchor farther out in 7 fathoms, or more.

The *Current* here in the *dry season* sets *generally* to the E. S. E. one knot per hour, and more at spring tides.

Sometimes, however, it will set E. S. E. for three or four days, and then set W. N. W. for the same time.

The distance from the right flagstaff to the *first cocoa-nut tree* to the left is 654 feet.

Do not attempt to land in your own boats at any of these *embarcaderos* unless it is very smooth.

## SAN BENITO.

This *embarcadero* is similar to the others. I have never been here.

NOTE.—It is to be observed that the *Table of Distances* gives the distance between San José and the *villages* of San Gerónimo and Sesecapa and not the *embarcaderos*.

## SAN JOSE.

I have been told that some 8 or 10 miles west of San José is a *Lagoon*, in which the early Spaniards built their vessels. The mouth of the *Lagoon* is now filled up ; except perhaps in the rainy season.

On page 18 (previous Remarks) I have spoken of an *old Tower at ISTAPA*. I am told there is no tower there, and what I took to be one was probably a tree with an overgrowing vine.

The old Port of Istapa is said to be but 6 or 8 miles East of San José. It is not visited at present.

The coast hereabouts is but little known, and nothing can be gained from the natives. Alvarado built vessels here for his expedition to Peru.

The following is from the "GEOGRAPHIA DE LA REPUBLICA DE GUATEMALA," and from information furnished me by the Honorable Mr. Corbett, H. B. M. Minister to Central America.

"The volcanoes in the main chain of the Andes, beginning at the S. E. limit, are the following :

NAME.	LATITUDE.	LONGITUDE.	HEIGHT.
Λ Pacaya .....	0 ° 21' 30"	C 0 ° 36' 34"	Metres.
Agua .....	14 21 30	90 36 34	2550
Λ Fuego .....	14 26 48	90 45 07	3753
	14 27 25	90 53 30	4001
Λ Acatenango .....	The active crater of Fuego, in a separate peak unattainable.	Height 4150 metres.	metres.
Atitlan .....	14 34 38	91 12 47	3573
Λ Quesaltenango .....	14 53 36	91 33 20	3109
Santa Maria .....	unknown.	91 36 34	3500
Tajamulco .....	15 09 58	92 06 07	unknown.
Λ Tacaná .....	15 24 11	92 15 17	do.

Near the volcano Atitlan, upon the Pacific slope of the Cordillera, are situated the volcanoes of *San Pedro* (which rises upon the western shore of Lake Atitlan) the *Zuñil*, *Santo Tomas*, and *Santa Clara*, which form a triangle between the meridians of  $91^{\circ} 22'$  and  $91^{\circ} 34'$ , and the parallels  $14^{\circ} 42'$  and  $14^{\circ} 49'$ .

[REMARK.—*Acatenango* shows near *Fuego* and makes it appear double.

Imray's Chart places Agua Vol. in lat.  $14^{\circ} 27'$ , long.  $90^{\circ} 31'$ ; his "Table of Positions" puts it in lat.  $14^{\circ} 09'$ , long.  $90^{\circ} 42'$ . Mons. Lapelin puts it in lat.  $14^{\circ} 32'$ , long.  $90^{\circ} 50'$ .

The position assigned by the Geographia agrees with the bearings from San José : Agua North, Fuego N.  $14^{\circ}$  W. These volcanoes are probably all correctly given.]

"The other volcanoes situated in other parts of the Republic are comparatively little known. They are the following :

NAME.	LATITUDE.	LONGITUDE.	
Chingo.....	14 06 30	89 36 00	
Santa Catarina.....	14 23 00	89 41 20	
Moyuta.....	unknown.	unknown.	
Jumay.....	do.	do.	
Alzata.....	do.	do.	
▲ Tecuamburro.....	do.	do.	
Ipala.....	do.	do.	
Monterico.....	14 32 40	89 29 30	1661 met. high
Ticanlu.....	unknown.	unknown.	
Tabon.....	do.	do.	
Jumay tepeque.....	do.	do.	
Amayo.....	14 17 00	89 48 00	
Cuma.....	14 18 00	89 46 10	
Pocohil.....	unknown.	unknown.	

The volcanoes marked thus ▲ are now in activity. The rest are extinct, although some of them, such as Moyuta, Tecuamburro and Ipala have hot and sulphur springs at their bases, which indicate some remains of combustion that may at some day come to life again.

#### PORTS.

The Republic of Guatemala has three ports on the Atlantic Coast, viz. :

Santo Tomas, in lat.  $15^{\circ} 38' 03''$ , long.  $88^{\circ} 35' 06''$ .

Livingston, in lat.  $15^{\circ} 48' 00''$ , long.  $88^{\circ} 38' 40''$ .

Izabel, in lat.  $15^{\circ} 24' 00''$ , long.  $89^{\circ} 09' 00''$ .

The first of these ports is situated in a fine bay, deep, clean and perfectly safe. It has been compared by experienced navigators with the bay of Havana. The second is in the mouth of the River Dulce, the outlet of the Lake of Izabel ; upon whose southern shore is the third of the above mentioned ports.

The CITY OF GUATEMALA is in latitude  $14^{\circ} 37' 30''$ , longitude  $90^{\circ} 30' 47''$ , and is 5,100 feet above the level of the sea. Its population is 45,000 souls. It is about 50 miles from San José.

The TOWN OF ESCUINTLA is midway between San José and the capital, in lat.  $14^{\circ} 16' 46''$ , long.  $90^{\circ} 47' 48''$ .

The ports of Guatemala on the Pacific are :

San José, in lat.  $13^{\circ} 56'$ , long.  $90^{\circ} 42'$ .

San Luis, in lat.  $14^{\circ} 13'$ , long.  $91^{\circ} 05'$ .

San Gerónimo, in lat.  $13^{\circ} 59'$ , long.  $91^{\circ} 09'$ .

Tecojate, in lat.  $14^{\circ} 04'$ , long.  $91^{\circ} 17'$ .

Champerico, in lat.  $14^{\circ} 17'$ , long.  $91^{\circ} 57'$ .

[REMARK.—*Sesecapa* is not mentioned in the *Geographia*. The—  
port of Champerico is the only one correctly located. The others—  
(with the exception of San Luis) being about 7 miles too far to the  
eastward, and the latitudes generally incorrect. San Luis is so  
much out in longitude that I think it must be confounded with some  
other embarcadero. The *Geographia* says it is at the mouth of the  
Samalá River; but according to Imray's Chart this river is between  
Champerico and the Ocos River.

#### RIVERS OF GUATEMALA.

The principal Rivers emptying in the Pacific are :

1. El Rio de Paz;
2. El de los Esclavos ;
3. El Michatoya ;
4. El Guacalate ;
5. El Nagualate ;
6. El Samalá ;
7. El Tilapa ;

which joins the Ocos six leagues from the bar, and is the boundary  
between Guatemala and Mexico.

There are many other rivers emptying into the Pacific, but they  
are of little importance.

1. *The Rio Paz* takes its rise in the neighborhood of the volcano  
Chingo, in the Department of Jutiapa, runs S. E. six leagues and  
then S. W.; emptying into the Pacific in latitude  $13^{\circ} 46' 02''$ , lon-  
gitude  $90^{\circ} 08'$ , dividing Guatemala from San Salvador.

It is the River Pasa of Imray's Chart, and the location of its  
mouth is probably correct.

2. *El Rio de los Esclavos* rises in the neighborhood of *Mataques-  
cuinte*, in the extreme north of the Department of Santa Rosa,  
passes by the village of the same name, which is the capital, and  
pursuing a tortuous course towards the south, empties into the  
Pacific through various branches or mouths.

3. *El Rio Micatoya* leaves the Lake Amatitlan near the city of  
the same name, runs south into the Pacific, dividing the Depart-  
ments of Escuintla and Santa Rosa.

4. *El Rio Guacalate* rises in the valley of Chimaltenango, near  
the town of the same name; in its southern course passes near  
*Antigua Guatemala*, descends to the plane of the coast between the

volcanoes Agua and Fuego, passes near *Escuintla*, and empties into the Pacific west of Port San José.

5. *El Rio Nagualate* rises in the Andes, in the Department of Sololá, and empties into the Pacific, dividing the Departments of Suchitepequez and Escuintla. The *Rio Cutzan* is a branch of this river.

6. *El Rio Samalá*. This river divides the Department of Suchitepequez in two parts, and empties into the Pacific at the port of San Luis.

7. *El Rio Tilapa*. This river rises in the Department of Quetzaltenango, and empties into the Pacific near the *Ocos River Bar*.

The mouth of the River *Ocos* is in latitude  $14^{\circ} 31' 07''$ , longitude  $92^{\circ} 19'$ , and has 8 or 9 feet on its bar. It is 25 miles from Chamerico and about 18 from San Benito.

#### PRODUCTIONS OF GUATEMALA.

Guatemala produces corn and other cereals, coffee, sugar-cane, cochineal, linseed, cotton, cacao, vanilla, zarzaparrilla, dye-woods, gunis, wool, hides, etc. etc.

#### SALVADOR.

*The Rio Santiago* in Salvador is 13 miles from Acajutla. I have passed one mile off its mouth. In running to make Acajutla, near dark, or in thick weather, it is a convenient land-mark from which to take a departure. Its mouth is in lat.  $13^{\circ} 40'$ , long.  $90^{\circ} 02'$ .

The entire coast from San José to Acajutla seems to be clear of dangers.

From San José to Acajutla the direct course is about E. by S., but as the current sometimes sets you in, it is better at night or in thick weather to steer E. by S.  $\frac{1}{4}$  S., or even E. by S.  $\frac{1}{2}$  S.

#### ACAJUTLA.

This port was discovered by Alvarado when on his way to join Pizarro in Peru.

#### LIBERTAD.

The volcano *Isalco* bears about N. W. by W.  $\frac{1}{2}$  W. from Libertad.

The city of San Salvador is 33 miles from Libertad.

From Libertad to the eastward the coast trends about E. S. E. for 30 or 35 miles, *and not E.  $\frac{1}{2}$  N. as shown on Imray's Chart.*

COAST LINE BETWEEN LIBERTAD AND POINT AMAPALA.

Assuming the position of *Lempa Shoal* as given in the "Table of Positions," the coast line between Libertad and Amapala Point would be as follows:

From Libertad E. S. E. to latitude  $13^{\circ} 15'$ , longitude  $88^{\circ} 46'$ , then E.  $\frac{3}{4}$  N. 28 miles to lat.  $13^{\circ} 13'$ , long.  $88^{\circ} 17'$ , then E.  $\frac{1}{4}$  S. about 30 miles to Amapala Point.

This may place the coast a little too far to the southward, but the error is on the safe side.

*Lempa Shoal* does not lie four miles *off shore*, but rather *extends* that distance.

From Amapala Point to Libertad the directions given me by a captain of the Central American Line are:

"Run W. by S. 34 miles until San Miguel volcano bears N. N. E., then W by N. until San Vincente volcano bears N. by W., and then N. W. by W.  $\frac{1}{2}$  W. to Libertad.

This carries outside of *Lempa Shoal*.

I have the following information from Señor Juan Portal, furnished me by the Honorable Mr. Biddle, U. S. Minister to Salvador:

"The volcano Isalco is in latitude  $13^{\circ} 56'$ , long.  $90^{\circ} 14'$ . Height 4,000 feet. San Salvador volcano is 7,200 feet high. San Vincente 7,500, and San Miguel 6,500.

"The mouth of the *Port Jiquilisco*, known by the name Bahia del Espiritu Santo, lies in lat.  $13^{\circ} 15'$ , long.  $88^{\circ} 38'$ . It is obstructed by a Shoal, that extends from three to six miles out into the sea, and the depth of its shallowest part in the line of the coast does not exceed two or three feet at low water.

"The harbor inside is extensive and deep—from 6 to 9 fathoms. Its length from 15 to 20 miles, and its breadth varies from  $1\frac{1}{2}$  to 3. In the interior has three habitable Islands: *De Puercos*, *San Sebastian*, and *Espirito Santo*. This last one the largest, from five to six miles long.

"Was it not for the sand bank at its mouth, this harbor would be the best in the Republic, since its depth inside suffices for a vessel of any draught.

"The altitude of the mountains is taken from the Map of the

Republic, drawn by Mr. Somnestern ; the remainder is my personal observation many years ago."

REMARK.—The longitude given by Señor Portal to *Isalco* is very much in error : Isalco is in longitude  $89^{\circ} 38'$ .

The Sailing Directions, Charts, and "Tables of Positions" all disagree in relation to the positions of the *Rio Lempa* and *Port Jiquilisco*.

Imray places Jiquilisco in

Latitude  $13^{\circ} 10'$ .  
Longitude  $88^{\circ} 16'$ .

Mons. Lapelin in

Latitude  $13^{\circ} 12'$ .  
Longitude  $88^{\circ} 29'$ .

The latter speaks of the *Horse-shoe Breakers* in

Latitude  $13^{\circ} 08'$ .  
Longitude  $88^{\circ} 39'$ ,

with San Miguel volcano bearing N.  $27^{\circ}$  E.

As Mons. Lapelin puts his longitude about 10 miles to far to the westward, this would put these breakers in longitude  $88^{\circ} 29'$ ; and if they are identical with the shoal alluded to by Señor Portal and the Lempa Shoal, it will be seen that Lapelin's position is 9 miles east of Señor Portal's, and 14 miles west of mine. Lapelin says nothing of a shoal extending into the sea.

This coast should be approached with caution, as very little is known of it. The lead is the only sure guide.

#### LA UNION.

This is a port very easy of access, and has been well surveyed.

I extract a few Remarks from my Note Book, made when last here in the "Alaska."

*Amapala Point* is not moderately high, as Imray says, but is a low point very like Cape Mala, with reefs off it, and heavy breakers. You can go within two miles of it with safety.

Between *Chicarena Point* and *Point Sacate* the Tide runs very strong : at times 3 or 4 knots an hour.

The Reef off Point Sacate is out of water and easy to avoid.

To enter the harbor : Pass Amapala Point 2 miles off, and steer N. N. E.  $\frac{1}{4}$  E. for Sacate Island. When Penguin Island (8 miles from Amapala Point) is abeam, haul up and pass between Sacate and Chicarena Points. Haul close round Chicarena and keep the

shore aboard, say  $\frac{1}{2}$  mile off. Pass the point [3 miles from Chicarene], which has a reef off it close to the rocks, and then gradually haul off from the shore [about N. W.  $\frac{1}{2}$  W.] until you are about  $\frac{3}{4}$  mile off, and anchor with the Custom House bearing S. W. or S. W. by W.

There is a sunken wreck somewhere to the N. W. of this anchorage.

Observe always in entering this harbor *not to Shut in Sacate Point with Chicarene*. The rule is to keep them open about a handspike's length.

#### AMAPALA.

*Amapala* is on Tiger Island, which belongs to Honduras. This is to be the terminus of the Honduras Railroad.

The Central American Steamers of the Pacific Mail Company touch here.

#### POINT GORDA.

In running for Point Gilones (of Imray's Chart) Gorda Point is seen on the port beam.

It is a high round hill, or *Morro*, and cannot be mistaken.

It is correctly laid down on Imray's Chart.

*Point Gilones* is about right on the same chart.

It is 41 miles from Point Gilones to Cape Blanco, and not 36, as given in the "Table of Distances."

#### MONTUOSA ISLAND.

The Reef off the northwest end of this Island lies more to the westward than marked on the Sheet Charts of the Admiralty, and extends quite three miles—mostly exposed.

The Central American Steamers generally pass inside this island.

#### POINT ARENAS.

In March, 1872, the Pacific Mail Company placed a Buoy on the shoal making to the southward of the Point and Light House. It was in 13 feet water at Low water spring tides.

*Bearings.*—

Light House.....	N. $\frac{3}{4}$ E.
North end of San Lucas Island..	W. $\frac{1}{2}$ S.
Aves Islet.....	S. W. $\frac{3}{4}$ S.

**Ranges.**—The extreme southern point of Cavallo Island *on* (or in a line with) the northern end of Venado Island.

The inner Nigreta just open with the main-land, and in a line with the Light House and eastern end of Cedro Island.

It is to be observed that this Spot is half a mile N. N. E. of the two-fathom spot marked on Capt. Belcher's Chart. At the latter spot there is now three fathoms water.

This shows that the shoal is shifting.

The Flood Tide (especially at Full and Change days) sweeps over this shoal with great velocity, and *the Buoy was drifted away a short time after.*

## C U R R E N T S .

I extract from my Log the following notices of Currents :

Between San Miguel Island and Cortez Shoal—

in July, - - *Eastward ½ knot.*  
in September, - - *do.*  
in January, - - *do.*

Between Cortez Shoal and San Benitos Islands—

in July, - - *Eastward 0.7 knot.*  
in December, - - *Eastward 0.9 knot.*  
in December, - - *Eastward 0.5 knot.*

Between San Benitos Islands and Point Abreojos—

in December, - - *Eastward 0.5 knot.*

Between Natividad Island and Cape San Lazaro—

in July, - - *Eastward 0.5 knot.*  
in September, - - *do.*

Between Cape St. Lucas and Mazatlan—

In June, wind fresh from the southward,  
*set North 8 miles, in the run.*

In July, wind moderate from the S. W.,  
*set North 10 miles.*

In July, wind light from the Eastward,  
*set N. N. E. 9 miles.*

In October, wind moderate from the Westward.  
*set North 14 miles.*

In October, wind moderate from the Northward.  
*set South 8 miles.*

In October, wind fresh from the Northward,  
*set South 12 miles.*

In January, wind moderate from N. W.,  
*set E. N. E. 12 miles.*

Between Cape St. Lucas and Cape Corrientes—

In January, *North 0.7 knot.*

A bottle from the Constitution in lat.  $22^{\circ} 51'$ , long.  $109^{\circ} 04'$ , thrown overboard June 22d, 1871, was picked up on Tibaron Island Nov. 12th, 1871—

*About 400 miles N. W. by N.  
In August, North 0.7 knot.*

Between Mazatlan and Cope Corrientes—

In July, - - - *North 1.0 knot.*  
In October, - - - *North 0.5 knot.*  
In October, - - - *South 0.5 knot.*

Between Cape Corrientes and Manzanilla—

*In August, - - - Northwest 1.0 knot.*

Between Manzanilla and Point Tequepa—

*In July, - - - Eastward 0.5 knot.*

Between Point Tequepa and Acapulco—

In July, - - - *Eastward 1.0 knot.*  
In June, - - - *Westward 0.7 knot.*  
In April, - - - *Eastward 0.5 knot.*  
In January, - - - *Eastward 1.0 knot.*

Between Acapulco and Port Angeles—

In July, - - - *Eastward 0.5 knot.*  
In December, - - - *Westward 0.5 knot.*  
In January, - - - *Eastward 0.6 knot.*  
In October, - - - *Westward 0.5 knot.*  
In January, - - - *Eastward 1.0 knot.*

In April, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 19^{\circ} 03' \\ \text{Lat. } 21^{\circ} 03' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 21^{\circ} 03' \\ \text{Lat. } 107^{\circ} 25' \end{array} \right\}$  *N. W. 0.5 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 104^{\circ} 30' \\ \text{Lon. } 107^{\circ} 25' \end{array} \right\}$

Between Morro Hermaso and lat.  $15^{\circ} 16'$ , long.  $94^{\circ} 37'$ —

*In October, Westward 0.5 knot.*

In February, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 19^{\circ} 56' \\ \text{Lat. } 21^{\circ} 26' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 21^{\circ} 26' \\ \text{Lat. } 108^{\circ} 16' \end{array} \right\}$  *S. W. by S. 0.8 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 105^{\circ} 51' \\ \text{Lon. } 108^{\circ} 16' \end{array} \right\}$

In April, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 16^{\circ} 09' \\ \text{Lat. } 14^{\circ} 18' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 14^{\circ} 18' \\ \text{Lat. } 92^{\circ} 00' \end{array} \right\}$  *Westward 0.5 knots.*  
 $\left. \begin{array}{l} \text{Lon. } 95^{\circ} 00' \\ \text{Lon. } 92^{\circ} 00' \end{array} \right\}$

In October, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 16' \\ \text{Lat. } 13^{\circ} 35' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 13^{\circ} 35' \\ \text{Lat. } 91^{\circ} 30' \end{array} \right\}$  *North 0.5 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 94^{\circ} 37' \\ \text{Lon. } 91^{\circ} 30' \end{array} \right\}$

In October, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 40' \\ \text{Lat. } 15^{\circ} 07' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 15^{\circ} 07' \\ \text{Lat. } 95^{\circ} 38' \end{array} \right\}$  *S. W. 1.0 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 94^{\circ} 31' \\ \text{Lon. } 95^{\circ} 38' \end{array} \right\}$

In October, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 07' \\ \text{Lat. } 15^{\circ} 26' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 15^{\circ} 26' \\ \text{Lat. } 96^{\circ} 00' \end{array} \right\}$  *N. W. 1.0 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 95^{\circ} 38' \\ \text{Lon. } 96^{\circ} 00' \end{array} \right\}$

In October, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 40' \\ \text{Lat. } 13^{\circ} 37' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 13^{\circ} 37' \\ \text{Lat. } 91^{\circ} 10' \end{array} \right\}$  *Eastward 0.5 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 94^{\circ} 31' \\ \text{Lon. } 91^{\circ} 10' \end{array} \right\}$

In January, between . . . . .  $\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 41' \\ \text{Lat. } 15^{\circ} 47' \end{array} \right.$  and  $\left. \begin{array}{l} \text{Lat. } 15^{\circ} 47' \\ \text{Lat. } 97^{\circ} 00' \end{array} \right\}$  *Eastward 0.5 knot.*  
 $\left. \begin{array}{l} \text{Lon. } 94^{\circ} 00' \\ \text{Lon. } 97^{\circ} 00' \end{array} \right\}$

In August, between...	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 00' \\ \text{Lon. } 94^{\circ} 00 \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 46' \\ \text{Lon. } 90^{\circ} 30 \end{array} \right.$	$\left. \begin{array}{l} \text{North } 0.5 \text{ knot.} \\ \text{Westward } 0.5 \end{array} \right\}$
In September, between...	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 25' \\ \text{Lon. } 95^{\circ} 40 \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 14^{\circ} 15' \\ \text{Lon. } 92^{\circ} 01 \end{array} \right.$	$\left. \begin{array}{l} \text{N.W. by W. } 0.7 \\ \text{North } 0.7 \text{ knot.} \end{array} \right\}$
In October, between...	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 43' \\ \text{Lon. } 96^{\circ} 43 \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 00' \\ \text{Lon. } 93^{\circ} 12 \end{array} \right.$	$\left. \begin{array}{l} \text{Westward } 0.5 \\ \text{South } 0.5 \text{ knot.} \end{array} \right\}$
In January, between...	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 40' \\ \text{Lon. } 93^{\circ} 30 \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 40' \\ \text{Lon. } 91^{\circ} 00 \end{array} \right.$	$\left. \begin{array}{l} \text{Westward } 0.5 \\ \text{South } 0.5 \text{ knot.} \end{array} \right\}$

## Off San José de Guatemala—

In September, - - -	<i>Westward 0.5 knot.</i>
In December, - - -	<i>Eastward 0.5 knot.</i>
In February, - - -	<i>Eastward 1.5 knots.</i>
In March, - - -	<i>Westward 0.5 knot.</i>

## Off Acajutla—

In April, - - -	<i>Northwest 1.0 knot.</i>
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## Between Libertad and Point Gilones—

In February, - - -	<i>Southwest 1.3 knots.</i>
In April, - - -	<i>Westward 1.0 knot.</i>

## Off Libertad—

In March, - - -	<i>Eastward 0.5 knot.</i>
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## Between San José and Point Gilones—

In June, - - -	<i>Northwest 0.8 knot.</i>
In July, - - -	<i>do.</i>
In July, - - -	<i>Southwest 0.3 knot.</i>

## Between San José and Acajutla—

In February, - - -	<i>Eastward 1.5 knots.</i>
In July, between.....	$\left\{ \begin{array}{l} \text{Lat. } 15^{\circ} 00' \\ \text{Lon. } 96^{\circ} 00 \end{array} \right.$
	and
	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 26' \\ \text{Lon. } 92^{\circ} 29 \end{array} \right.$
	$\left. \begin{array}{l} \text{North } 0.7 \text{ knot.} \\ \text{N. N. E. } 0.6 \text{ k} \end{array} \right\}$
In July, between.....	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 30' \\ \text{Lon. } 92^{\circ} 30 \end{array} \right.$
	and
	$\left\{ \begin{array}{l} \text{Lat. } 11^{\circ} 40' \\ \text{Lon. } 89^{\circ} 14 \end{array} \right.$
	$\left. \begin{array}{l} \text{N. N. E. } 0.5 \text{ k} \\ \text{Pt. Gilones } \end{array} \right\}$
In September, between	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 30' \\ \text{Lon. } 89^{\circ} 30 \end{array} \right.$
	and
	$\left\{ \begin{array}{l} \text{Lat. } 11^{\circ} 43' \\ \text{Lon. } 87^{\circ} 00 \end{array} \right.$
	$\left. \begin{array}{l} \text{N. N. E. } 0.5 \text{ k} \\ \text{North } 1 \text{ knot.} \end{array} \right\}$
In September, between	$\left\{ \begin{array}{l} \text{Lat. } 11^{\circ} 43' \\ \text{Lon. } 87^{\circ} 00 \end{array} \right.$
	and
	$\left\{ \begin{array}{l} \text{Lat. } 10^{\circ} 44' \\ \text{Lon. } 87^{\circ} 00 \end{array} \right.$
	$\left. \begin{array}{l} \text{North } 0.7 \text{ knot.} \\ \text{Pt. Gilones } \end{array} \right\}$
In October, between....	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 00' \\ \text{Lon. } 90^{\circ} 00 \end{array} \right.$
	and
	$\left\{ \begin{array}{l} \text{Lat. } 10^{\circ} 47' \\ \text{Lon. } 86^{\circ} 09 \end{array} \right.$
	$\left. \begin{array}{l} \text{North } 0.7 \text{ knot.} \\ \text{Eastward } 0.7 \text{ k} \end{array} \right\}$
In December, between	$\left\{ \begin{array}{l} \text{Lat. } 13^{\circ} 30' \\ \text{Lon. } 89^{\circ} 07 \end{array} \right.$

In December, between	$\left\{ \begin{array}{l} \text{Lat. } 10^\circ 50' \\ \text{Lon. } 86^\circ 10' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Pt. Gilones} \\ \text{Lat. } 9^\circ 40' \end{array} \right.$	$\left\{ \begin{array}{l} \text{N. W. } 1 \text{ knot.} \\ \text{W. N. W. } 1 \text{ knot.} \end{array} \right.$
In January, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 40' \\ \text{Lon. } 88^\circ 25' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 41' \\ \text{Lon. } 88^\circ 25' \end{array} \right.$	$\left\{ \begin{array}{l} \text{South } 0.5 \text{ knot.} \\ \text{Southwest } 1.0 \text{ knot.} \end{array} \right.$
In January, between	$\left\{ \begin{array}{l} \text{Lat. } 13^\circ 40' \\ \text{Lon. } 91^\circ 00' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 30' \\ \text{Lon. } 88^\circ 19' \end{array} \right.$	$\left\{ \begin{array}{l} \text{North } 0.6 \text{ knot.} \\ \text{North } 1.0 \text{ knot.} \end{array} \right.$
In April, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 06' \\ \text{Lon. } 86^\circ 20' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 30' \\ \text{Lon. } 88^\circ 19' \end{array} \right.$	$\left\{ \begin{array}{l} \text{North } 0.6 \text{ knot.} \\ \text{North } 1.0 \text{ knot.} \end{array} \right.$
In October, between	$\left\{ \begin{array}{l} \text{Lat. } 13^\circ 35' \\ \text{Lon. } 91^\circ 30' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 19' \\ \text{Lon. } 87^\circ 30' \end{array} \right.$	$\left\{ \begin{array}{l} \text{Southwest } 1.0 \text{ knot.} \\ \text{Southwest } 0.5 \text{ knot.} \end{array} \right.$
In October, between	$\left\{ \begin{array}{l} \text{Lat. } 13^\circ 37' \\ \text{Lon. } 91^\circ 10' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 10^\circ 09' \\ \text{Lon. } 86^\circ 00' \end{array} \right.$	$\left\{ \begin{array}{l} \text{Westward } 0.5 \text{ knot.} \\ \text{Westward } 0.7 \text{ knot.} \end{array} \right.$
In January, between	$\left\{ \begin{array}{l} \text{Lat. } 12^\circ 09' \\ \text{Lon. } 88^\circ 40' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 10^\circ 00' \\ \text{Lon. } 86^\circ 30' \end{array} \right.$	$\left\{ \begin{array}{l} \text{W. N. W. } 1.3 \text{ knots.} \\ \text{W. N. W. } 0.5 \text{ knot.} \end{array} \right.$
In July, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 37' \\ \text{Lon. } 89^\circ 14' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 10^\circ 00' \\ \text{Lon. } 84^\circ 45' \end{array} \right.$	$\left\{ \begin{array}{l} \text{Southwest } 0.5 \text{ knot.} \\ \text{Southwest } 0.7 \text{ knot.} \end{array} \right.$
In August, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 32' \\ \text{Lon. } 87^\circ 50' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 9^\circ 32' \\ \text{Lon. } 85^\circ 10' \end{array} \right.$	$\left\{ \begin{array}{l} \text{Northward } 0.7 \text{ knot.} \\ \text{Northward } 0.5 \text{ knot.} \end{array} \right.$
In October, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 30' \\ \text{Lon. } 88^\circ 19' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 8^\circ 48' \\ \text{Lon. } 84^\circ 06' \end{array} \right.$	$\left\{ \begin{array}{l} \text{W. N. W. } 0.5 \text{ knot.} \\ \text{W. N. W. } 0.3 \text{ knot.} \end{array} \right.$
In October, between	$\left\{ \begin{array}{l} \text{Lat. } 11^\circ 20' \\ \text{Lon. } 87^\circ 30' \end{array} \right.$	and	$\left\{ \begin{array}{l} \text{Lat. } 8^\circ 03' \\ \text{Lon. } 83^\circ 07' \end{array} \right.$	$\left\{ \begin{array}{l} \text{Eastward } 1.3 \text{ knot.} \\ \text{Eastward } 1.0 \text{ knot.} \end{array} \right.$

Between Cano Island and Point Puercos—

In April, - - *Eastward 1.0 knot.*

Between Sal-si-Puedes and Point Gilones—

In January, - - *Westward 0.5 knot.*

Between Cape Blanco and Montuoza Island—

In November, - - *Eastward 1.5 knots.*

Between Cano Island and Point Mariato—

In February, - - *Eastward 1.0 knot.*

Between Montuoza and Point Puercos—

In February, - - *Eastward 1.0 knot.*

Between Cano Island and Hicarita Island—

In October, - - *Eastward 0.5 knot.*

Between Burrica Island and Point Puercos—

In January, - - *Eastward 0.3 knot.*

In Panama Bay—

In September,	-	<i>Southward 1.0 knot.</i>
In November,	-	<i>Northward 1.0 knot, with strong S. W. wind.</i>
In February,	-	<i>Southward 1.0 knot.</i>
In February,	-	<i>Southward 1.5 knot.</i>
In April,	-	<i>Southward 1.5 knot.</i>
In January,	-	<i>Southward 0.5 knot.</i>

## S O U N D I N G S.

Two miles North of Point Loma, three miles off shore—

*65 fathoms, fine sand.*

Three-fourths of a mile off Cape San Lazaro—

*17 and 20 fathoms.*

Ten miles West of Acapulco—

*two miles off shore, 38 fathoms, black sand ;  
one and-a-half miles off shore, 28 fathoms, black sand ;  
one mile off shore, 20 fathoms, black sand.*

Three miles off Washington Bluff—

*21 fathoms, black sand.*

Twenty miles East of Acapulco, two miles off the mouth of the river—

*10 fathoms water.*

Fifteen miles East of Ventosa Point, two and-a-half miles off shore—

*12 fathoms, sandy bottom.*

Between San Benito and Champerico, eighteen miles off shore—

*25 fathoms, mud and sand.*

Off Champerico, three-fifths of a mile off—

*5½ fathoms, sand and mud.*

*One mile off—6½ fathoms, soft mud.*

Between San Luis and Seseca, fifteen miles off shore—

*20 fathoms, sand and gravel.*

Off Seseca, eleven miles off—

*17 fathoms, sand and mud.*

*One mile off—5½ fathoms, sand.*

Off San José de Guatemala, one-third of a mile off—

*9½ fathoms, sand and mud.*

Ten miles West of Acajutla, five miles off shore—

*21 fathoms, green mud.*

Half a mile off Acajutla—

*9 fathoms, sand, gravel and shells.*

Three quarters of a mile off Acajutla—

*10½ fathoms, mud mixed with sand.*

Two thirds of a mile off Acajutla—

9 fathoms, fine black sand;  
9 fathoms, black sand and mud.

Off Libertad, three fourths of a mile off—

9 fathoms, sand, gravel and shells.

Two-thirds of a mile off—

8½ fathoms, sand and shells. Hard bottom.

## B E A R I N G S F R O M A N C H O R A G E S.

### MAZATLAN—

In 11 fathoms :

Creston Island..... W. by S.  
Fort ..... N. by W. ¾ W.  
Black Rock. .... S. E. by S.

In 11 fathoms :

Creston Island..... W. ¾ N.  
Tower in Town..... N. by W.  
Black Rock..... S. E. by S. ¾ S.

In 10 fathoms :

Creston Island..... W. ¾ S.  
Fort..... N. by W. ¾ W.  
Black Rock..... S. E. by S. ¾ S.

In 10 fathoms :

Creston Island..... W. ¾ S.  
Fort..... N. by W. ¾ W.  
Black Rock..... S. S. E.

In 7 fathoms :

Creston Island..... S. W. ¾ W.  
Fort..... N. N. W.  
Black Rock..... S. S. E.

*From this anchorage Gama Island is shut in by Cielvo Island.*

This is an excellent berth in the dry or good season.

The bearing of Creston are the southern extremity.

### CHAMPERICO.—

In 6½ fathoms :

Flagstaff..... N. E. ¾ N.

### ACAJUTLA.—

In 10½ fathoms :

Wharf..... E. N. E.  
Fort or old Custom House..... N. E. ¾ N.  
Point Remedios ..... S. E. by S.

In 9 fathoms :

Wharf..... E. N. E.  
Old Custom House in line with bluff..... N. N. E. ¾ E.  
Point Remedios ..... S. E. by S. ¾ S.

In 9 fathoms :

- Wharf ..... E. N. E.
- Old Custom House just open with Bluff.
- Point Remedios ..... S. E. by S.  $\frac{1}{2}$  S.

**LIBERTAD.—**

In 9 fathoms :

- Wharf ..... N. by W.

In 9 fathoms :

- Wharf ..... N. N. W.  $\frac{1}{4}$  W.

In 8½ fathoms—sand and shells :

- Flagstaff on Wharf ..... N. N. W.
- Dist.  $\frac{1}{2}$  mile.

**POINT ARENAS.—**

In 5½ fathoms :

- Light House ..... N. by W.
- Sail Rock ..... S. by E.
- Sugar Loaf ..... S. W.  $\frac{1}{4}$  W.

In 6½ fathoms :

- Light House ..... N.  $\frac{1}{2}$  W.
- Sail Rock ..... S.  $\frac{1}{2}$  E.

In 4½ fathoms :

- Light House ..... N. W.  $\frac{1}{4}$  N.
- A bad anchorage.

In 7 fathoms :

- Light House ..... N. N. W.  $\frac{1}{2}$  W.

In 5½ fathoms :

- Light House ..... N. W. by N.  $\frac{1}{2}$  N.
- Sugar Loaf ..... S. W.  $\frac{1}{4}$  W.
- Aves Islet ..... S. W. by S.
- Sail Rock ..... S.  $\frac{1}{2}$  E.

This anchorage is directly off the Wharf.

In 5½ fathoms :

- Light House ..... N. W.  $\frac{1}{2}$  N.
- Wharf distant  $\frac{1}{2}$  mile.

TABLE OF DISTANCES BETWEEN SAN FRANCISCO AND PANAMA *via*  
 SAN PEDRO, SAN DIEGO, MAGDALENA BAY, CAPE ST.  
 LUCAS, MAZATLAN, MANZANILLA AND ACAPULCO.

From Cape St. Lucas to Manzanilla via Mazatlan, 491 miles.

From Cape St. Lucas to Manzanilla direct. 391 miles.

From San Francisco to Mazatlan direct, 1,327 miles.

TABLE OF DISTANCES BETWEEN SAN FRANCISCO AND SAN DIEGO *via*  
WAY PORTS.

TABLE OF DISTANCES BETWEEN SAN FRANCISCO AND SAN BENITOS  
ISLANDS *via* SAN PEDRO AND SAN DIEGO.

	Point Arguilla.	Point Conception.	Anacapa East End.	Point Fermín.	Point Loma.	Playa.	San Diego.	Coronados.	San Benitos.
San Francisco .....	221	233	272	297	351	431	438	442	461
Point Arguilla .....	12	51	76	130	210	217	221	240	506
Point Conception .....	39	64	118	198	205	209	228	228	494
Santa Barbara .....	25	79	159	166	170	170	189	189	455
Anacapa East End .....	54	134	141	145	164	164	164	164	430
Point Fermín .....	80	87	91	91	110	110	110	110	376
Point Loma .....	7	11	30	30	296	296	296	296	296
Playa .....	4	23	289	289	289	289	289	289	289
San Diego .....	19	285	285	285	285	285	285	285	285
Coronados .....	.....	.....	.....	.....	.....	.....	.....	.....	266
San Benitos .....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE OF DISTANCES BETWEEN ACAPULCO AND CHAMPERICO *via*  
PROMINENT MARKS AND PORTS.

	Tartar Shoal.	Little Morro.	Escondido Bluff.	Angeles Wit. Rock.	Port Guatulco.	Estreto Island.	Salina Cruz.	Morro.	La Puerta.	Soconusco Bluff.	San Benito.	Ocos River.	Champerico.
Acapulco .....	85	137	172	206	230	267	290	324	371	384	472	496	517
Tartar Shoal .....	52	87	121	145	182	205	239	286	299	387	411	432	432
Little Morro .....	35	69	93	130	153	187	234	247	335	335	359	380	380
Escondido Bluff .....	34	58	95	118	152	199	212	300	324	324	345	345	345
Angeles White Rock .....	24	61	84	118	165	178	266	290	311	311	311	311	311
Port Guatulco .....	.....	.....	.....	37	60	94	141	154	242	242	266	266	267
Estreto Island .....	.....	.....	.....	.....	23	57	104	117	205	229	250	250	250
Salina Cruz .....	.....	.....	.....	.....	.....	34	81	94	182	206	227	227	227
Morro .....	.....	.....	.....	.....	.....	47	60	148	172	193	193	193	193
La Puerta .....	.....	.....	.....	.....	.....	.....	.....	13	101	125	146	146	146
Soconusco Bluff .....	.....	.....	.....	.....	.....	.....	.....	.....	88	112	133	133	133
San Benito .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24	45	45	45
Ocos River .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	21	21
Champerico .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Acapulco to Champerico direct, 484 miles.  
Course, S.  $71^{\circ} 34' E.$

TABLE OF DISTANCES BETWEEN ACAPULCO AND PANAMA *via* WAY PORTS.  
*The P. M. S. S. Company's Steamers call at all these Ports.*

	Point Angelém	Salina Cruz.	La Purera	San Benito.	Champerico.	San Juan.	Teocotepe.	Seocapa.	San Gerónimo.	Acuña.	La Union.	Libertad.	Ampala.	Corinto.	Bon Juan	Point Arenas.	Panama	
Acapulco .....	207	288	368	470	513	525	537	557	563	589	649	687	791	812	875	981	1137	1591
Port Angeles .....	...	81	161	263	306	318	350	350	356	382	442	480	584	605	668	774	930	1384
Port Salina Cruz .....	...	80	182	225	237	249	269	275	301	361	399	503	524	587	693	849	1303	82
La Pueria (Tonala) .....	...	...	...	102	145	157	169	189	195	221	281	319	423	444	507	613	769	1223
San Benito .....	...	...	...	43	55	67	87	93	119	179	217	321	342	406	511	667	1121	
Champerico .....	...	...	...	12	24	44	50	76	136	174	218	299	362	468	624	1078		
San Luis .....	...	...	...	...	12	32	38	64	124	162	266	287	350	456	612	1066		
Seocapa (Village) .....	...	...	...	...	...	20	26	52	112	150	254	275	338	444	600	1054		
Teocote .....	...	...	...	...	...	6	32	92	130	234	255	318	424	580	1034			
San Gerónimo (Village) .....	...	...	...	...	...	...	...	32	86	124	228	249	312	418	574	1028		
San José .....	...	...	...	...	...	...	...	...	60	98	202	223	286	392	548	1002		
Liberiad .....	...	...	...	...	...	...	...	...	...	38	142	163	226	332	488	942		
La Union .....	...	...	...	...	...	...	...	...	...	...	104	125	188	294	450	904		
Acapulca .....	...	...	...	...	...	...	...	...	...	...	...	21	84	190	346	800		
Corinto .....	...	...	...	...	...	...	...	...	...	...	...	...	63	169	325	779		
San Juan .....	...	...	...	...	...	...	...	...	...	...	...	...	...	106	262	716		
Point Arenas .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	156	610		
Panama .....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	454		

Acapulco to Panama direct, 1,408 miles.

TABLE OF DISTANCES BETWEEN LIBERTAD AND PANAMA *via* PROMINENT MARKS AND PORTS.

Lemps Shoal	Amapala Point	Chirere Point	La Union	Amespala	Coseguita Point	Corinto	San Juan	Cape Desolado	Cape Gilones	Point Gilones	Cape Blanco	Point Arenas	Cano Island	Montuosa Island	Panama
60	88	99	104	125	149	188	232	295	376	417	451	548	669	903	
.....	28	39	44	65	89	128	172	235	316	357	391	488	609	843	
Point Amapala	.....	11	16	37	61	100	144	207	288	329	363	460	581	815	
Point Chicarene	.....	.....	5	26	50	89	133	196	277	318	352	449	570	804	
La Union	.....	.....	.....	21	45	84	128	191	272	313	347	444	565	799	
Amapala	.....	.....	.....	.....	24	63	107	170	251	292	326	423	544	778	
Point Coseguita	.....	.....	.....	.....	.....	83	146	227	268	302	349	520	754		
Corinto	.....	.....	.....	.....	.....	44	107	188	229	263	360	481	715		
Cape Desolado	.....	.....	.....	.....	.....	.....	63	144	185	219	316	437	671		
San Juan	.....	.....	.....	.....	.....	.....	81	122	156	253	374	608			
Point Gilones	.....	.....	.....	.....	.....	.....	.....	41	75	172	293	527			
Cape Blanco	.....	.....	.....	.....	.....	.....	.....	.....	34	131	252	486			
Point Arenas	.....	.....	.....	.....	.....	.....	.....	.....	97	218	452				
Cano Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	121	365				
Montuosa Island	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	234				

Libertad to Panama direct, 787 miles.

TABLE OF POSITIONS.

Name.	Lat.	Long.	Remarks.
West San Benito.....	28° 19'	115° 38'	
East San Benito .....	28° 19'	115° 33'	
N. Pt. Cerros Is.....	28° 22'	115° 14'	
C. St. Augustine .....	28° 03'	115° 23'	Bold close to.
Morro Hermoso.....	27° 31'	114° 43'	First bluff south of San Bartholo-
San Pablo.....	27° 14'	114° 25'	Dark slate-colored bluff.
Sandy Bluff .....	27° 12'	114° 21'	Bold close to.
San Roque Is.....	27° 09'	114° 24'	Low Rocky Island.
Asuncion Is.....	27° 07'	114° 19'	Sandy island—moderate height.
Remarkable Dome.....	27° 13'	113° 28'	There are three of these domes.
Pt. Abreojas .....	26° 45'	113° 30'	Very low, with dangerous reef [off it.
C. San Lazaro .....	24° 46'	112° 18'	Middle of cape.
Salatea.....	23° 02'	109° 40'	San José del Cabo Bay—approxi-
Isabel Island.....	21° 51'	105° 54'	[mate.
Corvetena Rock.....	20° 44'	105° 46'	Very low.
Isla Grande.....	17° 39'	101° 37'	Low and dark colored.
do. Blancas .....	17° 38'	101° 35'	Irregular shaped white rocks.
Black Rock.....	17° 37'	101° 32'	Mouth of Sihuatanajo harbor.
White Friars.....	17° 33'	101° 29'	Seven white rocks.
Morro Petatlan.....	17° 31'	101° 27'	Bold Bluff.
Pt. Tequepa.....	17° 17'	101° 01'	Bold to—one white rock to N. W.
Apusabalcos.....	17° 10'	100° 34'	Bold ridge—river and village.
Corcovado Peak .....	16° 57'	99° 29'	Humpbacked peak.
Tartar Shoal .....	16° 16'	98° 36'	Capt. Johnson. U. S. N.
Rio Verde .....	15° 59'	97° 48'	
Little Morro.....	15° 59'	97° 40'	Moderately high.
Morro Hermoso.....	15° 58'	97° 32'	High, and two miles wide.
Alcatrazes.....	15° 55'	97° 21'	Two white rocks. [Escondido.
Bluff (Escondido).....	15° 50'	97° 03'	Huts and trees on top. Near Pt.
White Rock .....	15° 40'	96° 30'	Well determined; very conspicu-
Port Angeles.....	15° 41'	96° 29'	ous. Mark for Port Angeles.
Port Sacrificios .....	15° 43'	96° 14'	Cove with Sandy beach.
Port Guatulco .....	15° 45'	96° 06'	Rocks lying half a mile off.
Estrete Island .....	15° 58'	95° 29'	Known by spouting rock.
Sand Down .....	15° 59'	95° 20'	Large white rock.
Salina Cruz .....	16° 11'	95° 11'	Port of entry.
Port Ventosa.....	16° 10'	95° 08'	Tower on point for light.
Church (white cupola) ..	16° 14'	94° 57'	Probably San Matheo.
do. .....	16° 14'	94° 49'	Probably Santa Maria del Mar.
do. .....	16° 15'	94° 48'	

TABLE OF POSITIONS.—*Continued.*

Name.	Lat.	Long.	Remarks.
San Francisco Bar. ....	16° 13'	94° 40'	Village of S. Francisco del Mar.
Morro. ....	16° 13'	94° 37'	Marked with strips of white sand.
E. Pt. San Maras Bay. ....	16° 06'	93° 49'	
La Puerta. ....	15° 56'	93° 49'	Position given by Capt. Don; this is the Embarcadero for Tomala.
Soconusco Bluff. ....	15° 50'	93° 36'	Double headed volcano back of [it. Active.
Vol. Tacaná. ....	15° 24'	92° 15'	
Huts (detached). ....	15° 12'	92° 55'	
Tajamulco Vol. ....	15° 10'	92° 06'	
San Benito. ....	14° 48'	92° 30'	Last port in Mexico. Approximate position.
Santa Maria Vol. ....	unknown	91° 37'	[mate position.
Vol. Quesaltenango. ....	14° 53'	91° 33'	Active.
Ocas River. ....	14° 31'	92° 19'	Geographia de Guatemala.
Vol. Atitlan. ....	14° 34'	91° 13'	
Champerico. ....	14° 18'	91° 56'	Flag staff; position well determined.
St. Louis. ....	14° 13'	91° 47'	Mouth of Rio Samalá. [mined.
Sesegapa Village. ....	14° 06'	91° 38'	Village on both sides of a river.
Embarcadero. ....	14° 05'	91° 36'	One large house and flagstaff.
Tecojate. ....	13° 55'	91° 22'	Four large houses.
San Geronimo Village. ....	13° 54'	91° 16'	[mouth of Guacalate River.
Embarcadero. ....	13° 54'	91° 10'	One large house; probably at Custom house; well determined.
San José. ....	13° 54'	90° 49'	
Agua Vol. ....	14° 27'	90° 45'	
Fuego Vol. ....	14° 27'	90° 53'	Double; active.
Pacaya Vol. ....	14° 21'	90° 36'	Active.
Istapa. ....	13° 55'	90° 42'	Position approximate.
Rio de la Paz. ....	13° 46'	90° 08'	Divides Salvador and Guatemala.
Rio Santiago. ....	13° 40'	90° 02'	Thirteen miles from Acajutla.
Acajutla. ....	13° 35'	89° 50'	Custom House.
Libertad. ....	13° 30'	89° 18'	Wharf.
Lempa Shoal. ....	13° 07'	88° 15'	Long. estimated.
Pt. Gorda. ....	10° 32'	85° 43'	A high Morro.
Pt. Gilones. ....	9° 56'	85° 38'	Morro Hermoso of Belcher.
Cape Blanco. ....	9° 34'	85° 04'	A white rock or islet off point.
Cano Island. ....	8° 40'	83° 51'	Reef extending a mile westward.
Pt. Llorena. ....	8° 34'	83° 42'	
Sal-si-Puedes. ....	8° 23'	83° 34'	
C. Matapalo. ....	8° 16'	83° 17'	

## SIGNIFICATION OF SOME INDIAN AND SPANISH TERMS.

Panama (Indian).....	A place abounding in fish
Pevico.....	A paroquet
Culebra.....	Snake
Taboguilla.....	Little taboga
Tórtala.....	Turtle dove
Papagayo.....	A parrot
Chubasco.....	A storm
Cape Mala.....	Bad Cape
Iguana.....	A large lizard
Fraile.....	A friar
Puercos Point.....	Pig Point
Noravjas Is.....	Orange Is.
Montuasa.....	Mountainous
Los Ladrones.....	The thieves
Burica Pt.....	Jackass Pt.
Matapala.....	A parasite (literally, "to kill the wood")
Malpelo.....	Bald headed
Sal-si-Puedes.....	"Go out if you can"
Chancha Pelona.....	"Pig without a hair"
Coreovado.....	Humpbacked
Escollo Rock.....	Shelf Rock
Herradura Bay.....	Horseshoe Bay
Dulce.....	Sweet
Nicaragua (Indian).....	Name of an Indian cacique
Guatemala (Indian).....	Rotten wood
Honduras.....	Depths
Salvador.....	The Saviour
Costa Rica.....	Rich coast
Aves Islet.....	Bird Islet
Pan de Azucar.....	Sugar loaf
Cape Velas.....	Sail Cape
Caldera.....	A kettle
Calderas.....	Hot springs
Pt. Arenas.....	Sandy Pt.
Ballenas Bay.....	Whale Bay
Cape Blanco.....	White Cape
Morro Hermoso.....	Beautiful round hill
Gorda Pt.....	Big Pt.
San Juan del Sur.....	St. John of the South
Cape Desolado.....	Cape Disconsolate
Corinto.....	Corinth
Realejo.....	A portable organ

Sacate.....	A kind of fodder
Libertad.....	Liberty
Santiago.....	St. James
Rio de la Paz.....	River of Peace
San José.....	St. Joseph
Aqua Vol.....	Water Vol.
Fuego Vol.....	Fire Vol.
San Gerónimo.....	St. Jerome
Tecojate.....	Indian
Sesecapa.....	"
Champerico.....	"
Benito.....	A Benedictine monk
La Puerta.....	The gate
Pt. Ventosa.....	Windy Pt.
Bufadero Rock.....	Spouting Rock
Pt. Sacrificios.....	Pt. of Sacrifices
" Angeles.....	" Angels
" Escondido.....	Hidden Pt.
Alcatraz.....	A kind of sea bird
Rio Verde.....	Green River
Pt. Eléna.....	Pt. Helen
Potreno.....	A piece of uncultivated land
Isla Grande.....	Grand or Large Island
Islas Blancas.....	White Island
Manzanilla.....	Camomile flower
Navidad Bay.....	Christmas Bay
Natividad Island.....	Island of the Nativity
Cape Corrientes.....	Cape of Currents
Tres Marias.....	The three Marys
Maria Madre.....	Mary, Mother of God
" Magdalena.....	Mary Magdalen
" Cleopha.....	Mary, wife of Cleophas
Ciervo Island.....	Stag Island
Creston.....	Crest of a helmet
St. Lucas.....	St. Luke
San Lazaro.....	St. Lazarus
Tatas Santos.....	All Saints
Cordonazo de San Francisco.....	Scourge of St. Francis
Cordonazo.....	A whip lash
Las Mesas.....	The tables
C. Rendondo.....	Round Cape
Pt. Entrada.....	Entrance Pt.
C. Tasco.....	Rough Cape
Pequeña Bay.....	Little Bay
Cerros Island.....	Hilly Island
Cedros "	Cedar "
Point Abreojos.....	Pt. Lookout (literally, "open your eyes")
Cenizas Island.....	Ash-colored Island

San Tomaz.....	St. Thomas
San Diego.....	St. James
Buenaventura .....	Good venture or good luck
Point Sal.....	Salt Pt.
Esteros Bay.....	Salt Marsh Bay
Piedras Blancas.....	White Stones or Rocks
Point Sur.....	South Pt.
Point Pinos.....	Pt. of Pines
Año Nuevo Point.....	New Year Pt.
Farrallone.....	A small volcano
Point Bonita.....	Pretty Pt.
Point Lobos.....	Seal Pt.
Santa Cruz.....	Holy Cross
Rincon Point.....	Corner Pt.

# TABLE OF DISTA

San Miguel Island . . .		256	
Point Concepcion. . .		233	251
Point Arguilla. . . . .		221	228
Piedras Blancas. . . . .		151	146
Point Sur. . . . .		100	216
Monterey Lighthouse.		83	95
Point Año Nuevo. . . . .	54	50 $\frac{1}{2}$	78
Point Pigeon. . . . .	19 $\frac{1}{2}$	45 $\frac{1}{2}$	45
Point Pillar. . . . .	11	20	40
Point Pigeon. . . . .	6 $\frac{1}{2}$	17	37
Point Año Nuevo. . . . .		26	42
Monterey Lighthouse.		31	64
Point Sur. . . . .		25	58
Piedras Blancas. . . . .		54	75
Point Arguilla. . . . .		59	126
Point Concepcion. . . . .		51	196
San Miguel Island. . . . .		32 $\frac{1}{2}$	208
Cortez Shoal. . . . .		17	231
San Benito Island. . . . .			189
Cape St. Angustin. . . . .			212
Natividad Islands. . . . .			207
Asuncion Islands. . . . .			251
San Lazaro. . . . .			158
Point Entrada. . . . .			152
Cape Tosco. . . . .			175
False Cape. . . . .			123
Cape St. Lucas. . . . .			84
Cape Corrientes. . . . .			107
Frailes. . . . .			23
Navidad Head. . . . .			12
White Island. . . . .			37
Manzanilla. . . . .			
Point Tejpan. . . . .			
Islas Blancas. . . . .			
Morro Petatlan. . . . .			
Point Tequepa. . . . .			
Acapulco. . . . .			
Tartar Shoal. . . . .			
Morro Hermoso. . . . .			
Point Angeles. . . . .			
Point Sacrificios. . . . .			
Cape Blanco. . . . .			
Cano Islands. . . . .			
Cape Matapalo. . . . .			
Burica Point. . . . .			
Montuosa Island. . . . .			
Hicarita Island. . . . .			
Point Mariato. . . . .			
Point Puercos. . . . .			
S. Fraile. . . . .			
Cape Mala. . . . .			
Iguana Island. . . . .			
Bona Island. . . . .			
Taboguilla Island. . . . .			
San Jose. . . . .			
Buoy at Panama. . . . .			
Fort Point. . . . .	54	8 $\frac{1}{2}$	3

Table of Distances between Point Sacrificios

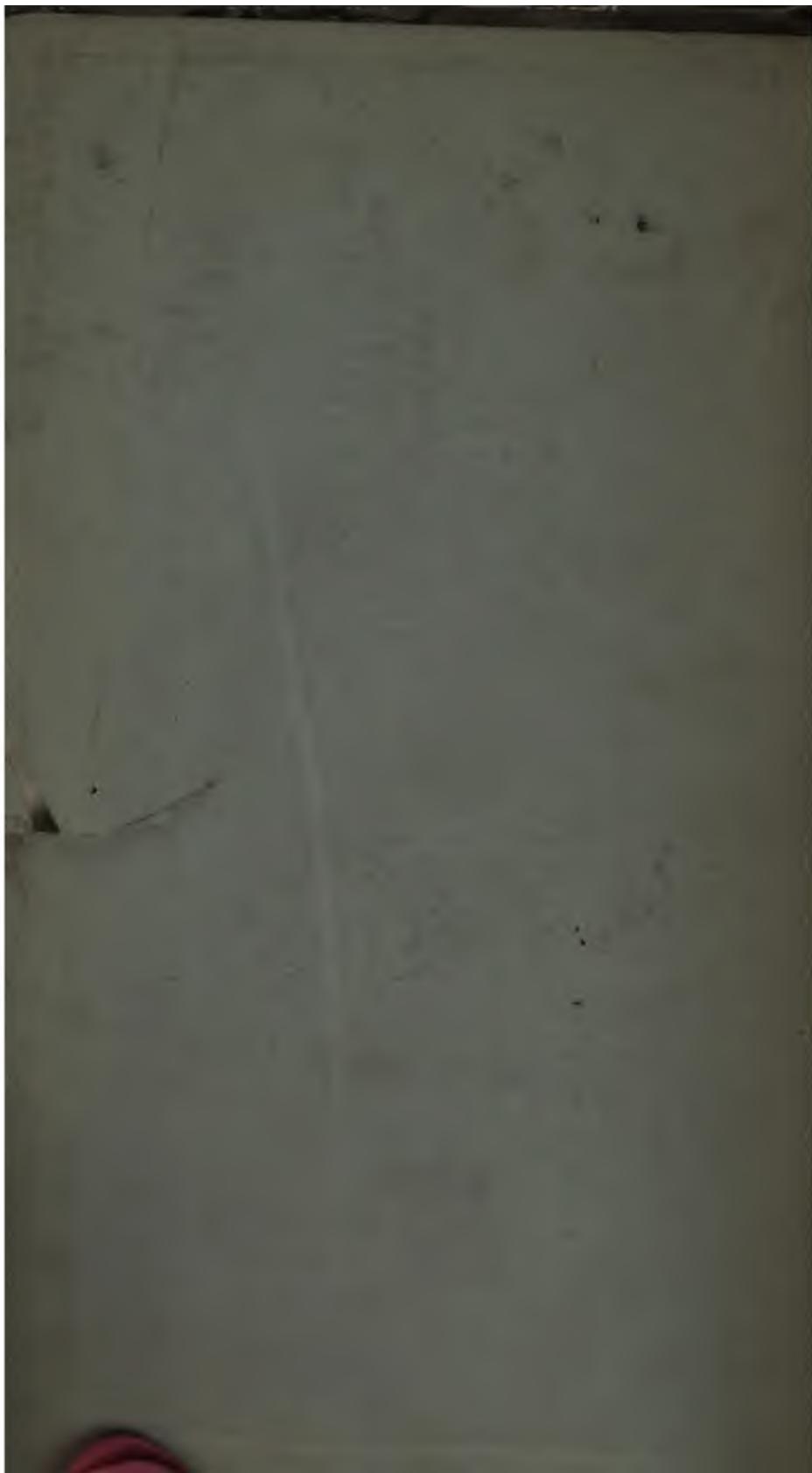
	Tonala Bar. . . . .	Estrete Island. . . . .	Point Ventosa. . . . .	Tomala Bar. . . . .
Point Sacrificios. . . . .	50		78	124
Estrete Island. . . . .			28	74
Point Ventosa. . . . .				46
Tonala Bar. . . . .				
Water Volcano, abeam. . . . .				
Point Gilones. . . . .				
Cape Blanco. . . . .				

From San Francisco to Panama via Manzanilla

From San Francisco to Panama via Manzanilla,

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